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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Revenue DEPARTMENT

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GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

2nd August 1878, No. 1212.

Read the following paper:—

No. 9. From C. J. LYALL, Esq., Under Secretary to the Government of India, Department of Revenue, Agriculture, and Commerce (Agriculture and Horticulture), to the Secretary to the Government of Madras, dated Simla, 5th July 1878, No. 179:—

I am directed to forward, for the information of His Grace the Governor in Council and for communication to the Superintendent of the Government Farm at Sydapet, copies of the papers marginally noted, being reports by the Director of Agriculture and Commerce, North-Western Provinces and Oudh, on the subject of the experimental cultivation and curing of tobacco at Gházipur and in Kumaun in the North-Western Provinces and at Pusa in Bengal.

From the Director of Agriculture and Commerce, to the Government of the North-Western Provinces, No. $\frac{806\text{-A}}{\text{XXII}-25}$ and $\frac{834\text{-A}}{\text{XXII}-25}$, dated 18th October and 10th November 1876.

From the Director of Agriculture and Commerce, to the Government of the North-West Provinces and Oudh, No. $\frac{628\text{-A}}{\text{LVI}}$, dated the 6th May 1878.

ENCLOSURE No. 1.

From E. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces, to the Secretary to Government, North-Western Provinces, dated Allahabad, 18th October 1876, No. $\frac{806\text{-A}}{\text{XXII}-25}$.

I have the honor to submit the following report upon the present position and prospects of the tobacco experiment at Gházipur, on which I have now had sufficient opportunity to form an opinion, and although the data from which it is derived are confessedly imperfect, yet sufficient experience has been gained to enable me to indicate in what direction to suggest further steps. I write this letter at the conclusion of a month's residence at Gházipur, during which time I have been in constant communication with the Virginian curer.

CIRCUMSTANCES UNDER WHICH FARM WAS ESTABLISHED.

2. About a year-and-a-half ago the Government of India removed the stud from Gházipur, and directed the Government of the North-Western Provinces to utilize any portion of the land which might be required as a model farm. About the same time the North-Western Government desired me (as being in charge of the local Agricultural Department) to direct my attention to the development of tobacco cultivation and trade.

3. Shortly after this occurred, Mr. Cooper, the Cawnpore member of the Calcutta firm of Messrs. Begg, Sutherland, and Co., intimated to me that their firm was anxious to institute an enterprise in tobacco, and this led to a proposal being made by me to offer the stud lands and buildings on favorable terms to Messrs. Begg, Sutherland, and Co. on such conditions as would guarantee their *bonâ fide* continuance of the undertaking. This course was approved by Government.

4. Briefly, the terms which have been made are these: about 1,200 acres have been rented to the firm at about half the rental of Rupees 10,000 or Rupees 11,000, which was being paid direct to Government by the cultivators, *i.e.*, they have been assessed at the ordinary 50 per cent. revenue of the temporarily-settled districts: the concession may be roughly estimated at Rupees 5,000, in addition to which a rent-free occupation of certain of the stud buildings and bungalows has been allowed. The concession is granted for five years.

5. On their part Messrs. Begg, Sutherland, and Co. have brought over a curer from Virginia to whom they pay £300 a year, and they are responsible for all expenditure on cultivation, curing apparatus, and machinery, for all loss on tobacco operations, and for all repairs to buildings occupied by them. They have also agreed to allow the Gházipur operations to be open to inspection. The curer is engaged for three years.

6. The reasons which led to the selection of Gházipur as the best place in which to commence an enterprise were the following :—

(1.) The fact that the land was in the possession of Government.
(2.) The presence of buildings which might be utilized for curing operations and other purposes.
(3.) The proximity of the land to a town from which manure might be obtained.
(4.) The presence of a large population of Koeris, who are the best class of cultivators for such a plant as tobacco, and who may be described as the market gardening class.
(5.) The proximity of the opium factory, which affords another manure supply, and has accustomed the agricultural population to work for Government.
(6.) The necessity of bringing a foreigner for the first year or two into a civilized and accessible place.
(7.) The desirability of being below the frost line.

CLAIMS OF EX-PROPRIETORS TO STUD LANDS.

7. The completion of arrangements with Messrs. Begg, Sutherland, and Co. was hampered by a claim raised by one of the former proprietors of the stud lands to the restoration of the proprietary right to himself. It was well understood that the same claim would be set up by all the ex-proprietors if this was successful. Pending the decision of the Civil Courts in the case, Government, who had induced Messrs. Begg, Sutherland, and Co. to bring out a curer, guaranteed to secure to them at least 500 acres if necessary by purchase.

8. The case has been decided in the Court of the Judge of Gházipur in favor of Government, and, although an appeal may be made, I do not think that the former proprietors have any chance of a decision in their favor, as the records in the Government offices prove that the land was taken up permanently or for such time as Government might require the land, without any reference to the special requirements of the stud.

AGRICULTURAL OPERATIONS ON FARM.

9. The stud lands had hitherto either been uncultivated or only planted with crops of inferior description. Very few cultivators resided on it, and it had a bare and neglected look, although possessing natural soil of quality very well suited for working-up with manure into first-class garden soil. I determined to settle Koeris upon it, to divide it into well-defined blocks, and to collect manure. Land is prepared for tobacco in the rains, sown in August or September, and planted out in September or October, and gathered in during January and February. Last year no operations could be undertaken till April, when the old leases expired; and then the first step was, as I have stated, to build huts and plant villages over the land for the new Koeris. I left India on leave in May, and at that time it was not known when a curer would come out, or if, indeed, he would come at all. I left directions to continue the establishment of villages, the division of the land into blocks, and the collection of manure, all of which the Collector, Mr. Oldham, kindly arranged. I provided also for the planting of a few acres of tobacco, the management of which Mr. Cooper (the Cawnpore partner) undertook as far as the distance would allow him, and I appointed a Eurasian (who had worked for some years an indigo factory) to carry out his orders. At the same time I directed the Superintendents of the Government Farms at Allahabad and Cawnpore each to cultivate three or four acres.

10. When I returned in November I found that the Gházipur tobacco had been put in late, and was very poor. It had been cultivated unskilfully, and was not good in appearance. The Manager under Mr. Cooper was perhaps not so efficient as he was represented to be, but the fact must be fully appreciated that the farm was a great deal too young for the cultivation of tobacco, which requires either rich forest land or a carefully-worked-up and mellowed soil. The Allahabad tobacco was very fine in appearance and well grown. The Cawnpore plant was smaller and not very well cultivated, but better than that in the Gházipur fields.

11. Here let me describe the conditions under which tobacco was grown at each place and point out the deductions which may be drawn from the results.

In Gházipur most of the land had never been well tilled, and had, with the exception of a small area, never received manure until last year. It was also exposed to wind and drought. The tobacco was cultivated without skilled superintendence and imperfectly irrigated. In Allahabad the land was richly fed with nitrogenous manure, and had been cultivated as a market garden for some few years. The plant was carefully tended and irrigated. It was, however, exposed to a wind which broke and dragged the leaves on the ground. In Cawnpore the soil was garden soil, but not so richly manured as at Allahabad, and the situation was more sheltered. The Gházipur plant gave a poor outturn and was much broken and trailed on the ground by the hot winds, but was in many cases better flavored and more fit for working up into a good class tobacco than that at Allahabad, which was coarse and rank, although to an inexperienced eye it looked magnificent on the field. The Cawnpore plant gave a better outturn of leaf and a larger percentage of tobacco fit for curing than either.

12. The conclusion is that soil requires to be worked up to the condition of garden mould, to be manured with vegetable and other light manures rather than with the strong nitrogenous manures which natives generally use for tobacco.

13. The system adopted on the Gházipur farm will in the course of a year or two convert much of the area into garden land. The market gardening class of cultivators have been selected and distributed into small hamlets over the farm. Each man has four acres and keeps a pair or two of bullocks in his hut close to the ground, and they are themselves with their whole families, brothers, wives, and children, always at work in the fields. Already the appearance of the soil is changing. Any one, however, who knows anything about farming, or even gardening, must be aware that a proper condition of soil cannot be obtained in one or even two or three years.

14. Next year spring green crops will be sown on some at least of the land selected for tobacco in the following year. Meanwhile opium "trash," or broken leaves from the opium factory, ashes and bones from the city, and lime from the town kilns are collected to supplement and be mixed with the nitrogenous manure of the farm.

15. Irrigation is the chief difficulty at Gházipur. Water is deep, 60 feet or more from the surface, and both the construction of wells and the lifting of water are expensive. There is, however, a large rice tract on the north, the water from which is being concentrated in tanks, which will go very far towards supplementing well irrigation. The natural drainage of two or three square miles which has hitherto escaped to the Ganges, swamping a large area in its course, will thus be diverted and stored for the use of the farm.

16. The farm is now fast growing into a condition of fertility, and has a very different appearance from that which it had a year ago, and in another year or two's time a great part of the land of central block of 500 acres will have been converted into soil of good quality for the production of tobacco. So far the progress being made is exactly what I intended and anticipated.

17. The seasons have been unfortunate. Last Christmas there was no winter rain, and the tobacco had to contend with excessive dryness. This year there has been an exceptional drought, so serious that I have thought of suggesting the advisability of abandoning the planting of tobacco for this season and of allowing the curer meanwhile to examine native tobacco cultivation and curing in other parts of India rather than to risk a heavy loss and unsatisfactory results. But such a course will only be adopted (if at all) in case of the continuance of the drought. Messrs. Begg, Sutherland, and Co. are extremely anxious, I believe, not to accept the suggestion in any case, although I am sure that the course I propose will be the least disappointing in the end if the drought becomes as serious as it threatens to be. The effect of a dry season on tobacco is well exemplified by the following extract from a Virginian paper which describes the failure in America of the present season's crop :—

"Tobacco presents the very poorest prospect ever witnessed by the oldest planters.' The frost, bugs, cut-worms, and horn-worms and the failure of planting seasons have cut down the crop with us to barely one-third of the usual average. The plants are still dying during the dry hot weather, while those that are living are making but slow growth. The season for the growth and maturity of the weed is about half gone. Plant-beds generally are burnt up, and it is now too late to plant, if plants were plentiful, although the indications point to about one-third of the usual average for this staple. The same substantially applies to our adjoining counties, the largest tobacco-producing district in Virginia and North Carolina. The tobacco traders, and most of the journals in their interest, profess to believe in the production this year of 'two-thirds of a crop.' Unless the prospect is greatly better in other portions of the State than in Halifax, the production of half a crop is an utter impossibility."

ARRIVAL OF THE CURER.

18. The curer came out in January,—Mr. Williamson of Pittsburg, Virginia,—and I must express my conviction that Messrs. Begg, Sutherland, and Co. have performed most completely their promise to secure the services of a competent curer. Mr. Campbell, the member of a well-known tobacco-exporting firm called Campbell and Co., and which is perhaps the most widely-known American firm in the trade, undertook on behalf of Messrs. Begg, Sutherland, and Co., who appear to have had some acquaintance with his firm, to select with care a thoroughly-experienced and steady man. This I am assured that he did, and certainly nothing could have been

more satisfactory than Mr. Williamson's conduct and earnest endeavours for the success of the undertaking. He has, however, suffered slightly in health.

19. Mr. Williamson set to work at curing the Gházipur tobacco in March, April, and May, during which months I visited Gházipur several times. A great deal of the tobacco was very poor, and the curer complained of the way in which the leaves had been broken, and "dirtied" by being trailed on the ground by the dry west wind. Some of the Allahabad tobacco leaves were brought down by train to Gházipur, but were found very rank and coarse. Once during May, and afterwards in June, the curer went to Cawnpore and cured the tobacco at Cawnpore. It was, as I have before stated, in better order, and a much larger percentage of leaf was good.

TOBACCO-CURING AND RESULTS OF GHÁZIPUR OPERATIONS.

20. It has from the first been intended to ascertain at Gházipur what can be effected (1) in producing well cured tobacco leaf for the use of manufacturers of smoking tobacco, (2) in manufacturing tobacco for smoking.

21. The second object was believed to require much more capital, special knowledge, and appliances than the first, and it was determined to make the first experiment complete before attacking the second.

22. I will endeavour to place before Government all the facts which I have myself acquired about tobacco curing and manufacturing, and the arguments which it appears to me may be fairly based upon them. Data are at present very imperfect, and the experience which has been gained in this country very small. It is not improbable, therefore, that many of the ideas which I have formed, and of the estimates which I shall give below, will require considerable modification. Before proceeding to figures, however, I must explain that in every estimate I have assumed figures unfavorable to profits, *i. e.*, that cost can hardly be higher or income less than I have estimated them to be.

TOBACCO-CURING.

23. The curing of tobacco (whether for sale in a foreign market or for conversion into manufactured tobacco in India) has first to be considered. I have been surprised to find that 100 acres is considered to be a large area for the supply of a single curing house in America. A single curing establishment in Virginia seldom undertakes more. When I visited the colonies last year I became acquainted with Mr. William Cameron, a leading member of the firm who sent out Mr. Williamson, and who has lately established a large factory at Sidney, where cured leaf exported from Virginia is manufactured. This gentleman informed me that curing houses are in Virginia generally managed by the planters who grow tobacco, and that 100 acres was considered a very large area for one tobacco farmer to cultivate and cure annually. Mr. Williamson confirms the statement made by Mr. Cameron.

24. The following is an attempt to estimate the conditions of cultivating 100 acres annually.

25. The average outturn of dry tobacco leaf on good land, with careful cultivation, may, I believe, be safely estimated at 800 lb. per acre. The cost at which 800 lb. of fairly good tobacco may be bought from the cultivators can, I feel sure, be kept within a maximum price of Rupees 80 per 800 lb. The curer is of opinion that tobacco leaf here can be cured so as to sell for an average price of 5*d.* a lb. (untaxed) in the English market, and considers this a safe estimate, and expects to increase the average to 6*d.* or 7*d.* The price of 800 lbs. at 5*d.* a lb. is £16-13-4. There is therefore the difference between £16-13-4 and Rupees 80 or (without calculating exchange) £3 on which to cure, send home, and obtain profits on 800 lbs. of tobacco, which is equivalent to £1-1-8 per 100 lb.

26. The difficult point to ascertain is the actual cost of curing, and I wish here to point out distinctly that the chief use of the Gházipur experiment will be to discover it. The Government of the North-Western Provinces have placed Messrs. Begg, Sutherland, and Co. in such a position that they can solve the problem at a comparatively small cost to themselves, and I have spared no pains to impress upon them that they must not hope to go any further during the first year or two of the enterprise. While I am bringing the farm into a proper condition for the cultivation of tobacco, and while Mr. Williamson is learning the conditions of the climate and the character of the people with whom he has to deal, the problem is gradually being solved. Messrs. Begg, Sutherland, and Co. were at first intent upon immediately undertaking extensive cultivation in the hope of large profits, but I pointed out that to cultivate unprepared land and to throw an enormous quantity of labor upon their curer, bewildered as he must be with the new conditions with which he is surrounded, could only have one result, which would certainly not be in the direction of large profits. I am glad to say that the firm is coming round to the same opinion.

27. Mr. Williamson came out too late this year to direct in any way the cultivation of tobacco, but he was in time to gain a great deal of experience as to the conditions of the climate

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during the curing season. The season was, in consequence of the absence of winter rains, unusually dry, and the curer was able to decide that steam would be a necessary adjunct to the curing house, and a very rude steam apparatus was attached to one of the stud buildings, which was so built up as to prevent the escape of steam. I may mention that steam is used in America in the manufacturing, but not (in Virginia at any rate) in the curing house.

28. The curer advises getting in the crop for curing as early as possible, so as to avoid the chance of dry west winds, which tear the plants in the fields and make the leaves difficult to handle in the curing house, and considers also that it should be ascertained whether it will not be better to leave tobacco to be handled in the rains. In this case it will be necessary to use fuel to dry instead of to moisten the air of the curing rooms whenever necessary. The curer kept some of his leaf on purpose to try the experiment, and believes that it is better to do so, as the leaf is more manageable when the atmosphere is damp. I do not feel sure that he is right simply for the reason that we have this year almost a drought, and that consequently the curer does not know how damp an Indian rainy season can be.

29. The uncertainty which still exists as to the final method which will be adopted and the incompleteness of the arrangements this year, due to the curer not being acquainted with the requirements of the climate, as well as to the fact that no proper curing houses of apparatus could possibly be prepared in time, quite prevent my being able yet to give any safe indication from Gházipur experience of what curing expenditure will be, nor can I draw any inferences from expenditure in America, where the cost of curing is involved in the expenses of the farms. I can only state what the margin for curing is likely to be on the assumption of the statistics given in paragraph 25.

30. I estimated a margin of £1-1-8 for curing, export, and profits on 100 lb. and an outturn on 100 acres of 80,000 lbs; the margin on 100 acres is therefore £1-1-8 × 800 = £867-4-0:—

	£	s.
Curer's salary is	300	0
Cost of export (say)	300	0
Left for curing	267	4

or less than 1*d.* a lb.

31. The margin left for curing can be enlarged in five ways:—

(1.) By the increase of outturn over 800 lb. per acre.
(2.) By the increase of area over 100 acres.
(3.) By the reduction of cost below Rupees 80 for 800 lb.
(4.) By the improvement of curing to a class which will fetch on the average more than 5*d.* a lb.
(5.) By the removal or reduction of curer's salary.

32. I am hopeful that a great improvement may be made under head (3), and as the curer has succeeded in curing some very good specimens of what is technically called bright (or golden) leaf, which is valued at a high price (1*s.* to 2*s.* a lb.) in the tobacco market as "wrapping leaf," *i.e.*, as leaf in which inferior tobacco is wrapped, and of which class he will probably be able to produce a large percentage as time goes on, it is evident that there is also room for extension of profit under head (4).

33. A penny in the lb. decrease in the cost of leaf, or a penny in the lb. increase in the average price of cured leaf, gives an increase to the profit on 100 acres of over £300. On the assumption therefore that 5*d.* a lb. will pay expenses, 6*d.* a lb. will give £300 profit, 7*d.* a lb. £600 profit, and so on.

34. Although the higher-priced tobaccos require a much more expensive method of preparation, yet it is probable that the average price of tobacco may be raised to 6*d.* or even 7*d.* without any corresponding increase in cost of cultivation or curing. The price adjudged in England and Australia will be some guide to an estimate on this point. Samples of cured leaf were sent home this year to England, and I am now sending samples to the Sidney factory. Although the leaf is inferior to what can be produced in future years, in consequence of the curer only having arrived at the end of the year, without any means and appliances ready for him, still the opinion which is given of it by disinterested judges will be of some value. The most serious item of expenditure is the curer's salary. If this item is removed curing must pay, and I cannot but believe that indigo planters and others will be able to gain sufficient knowledge and experience to be able to turn out tobacco of a good marketable quality.

MANUFACTURE OF TOBACCO.

35. I cannot give much detailed information about the method followed in manufacturing tobacco in America, nor is it at present necessary. If skilled experience is requisite for the proper curing of tobacco, much more so is it in the manufacture of it, as the production of the article in a marketable form depends to a great extent upon a practical acquaintance with trade

secrets, as well as upon a knowledge of the qualities of the tobacco leaf brought to the factory. It may be taken for granted that, if a factory is established, it must be conducted by a person or persons skilled in the business.

36. The following facts are, however, of general importance. A first-class factory in America will, I am informed, turn out 10,000 lb. of the manufactured article daily. Foreign matter is mixed with the leaf in manufacturing, but, on the other hand, the stem is rejected; and, on the whole, a given weight of cured leaf, including stem, will supply a greater weight of manufactured tobacco, including foreign matter. The excess will not, I am informed, exceed 10 per cent. Supposing, then, that 9,000 lb. of cured tobacco are required to feed a first-class factory daily, the quantity required to supply the annual outturn is 365 × 9,000, or 3,285,000 lb. This, at 800 lb. an acre, involves the cultivation of 4,106 acres. If we may assume that tobacco ought not to be grown more than once in three years on the same land, the extent of land required to feed a first-class factory would be about 12,000 acres. A small factory is about one-fourth of the above size, and would require an area of 3,000 acres to feed it.

37. Formerly a great deal of hand-machinery was used in America, but the increase in cost of manual labor has resulted in the substitution of much steam and hydraulic machinery. A great deal of manipulating work is, however, still done by hand, as I myself had the opportunity of observing in the Sidney factory, where machinery is utilized to the fullest extent.

38. It appears to be the invariable practice in the manufacture of tobacco cakes or twists to have the covering leaves or "wrappers" of much better quality than the inside leaves or "fillers." The leaves most valued for wrapping the higher classes of tobacco are of a fine texture and of a bright golden color. They fetch 1*s.* to 2*s.* a lb. The fillers vary greatly in price, according to the quality of the tobacco. The weight of wrappers to fillers is, in ordinary tobacco cakes, about one to four.

39. The cost of manufacture in America is estimated about 5*d.* a lb., inclusive of interest on capital, but exclusive of all kinds of taxation. The state of things in Virginia appears to be this: large profits, or rather profits upon an extensive scale, are not made by the tobacco farmer, but by the tobacco manufacturer. The tobacco grower and curer is ordinarily the farmer of an estate who makes money out of a variety of produce as well as out of tobacco. Tobacco may be his main crop, but if tobacco fails him in any season, he falls back upon something else, just as an indigo cultivator in Tirhoot pays his rent out of cereals when the rain swamps his indigo. Manufacture is the trade in which capital is invested with the object of securing steady and extensive profits.

40. No export tax of importance is levied on tobacco sent on boardship, but a heavy inland revenue duty is charged on manufactured tobacco retained in the country.

41. Although the curer has had no proper appliances to work with in Gházipur, yet he has succeeded in turning out tobacco cakes of very good appearance and of tolerably fair quality. The tobacco is pleasant to smoke, and has much more flavor than any Indian-made tobacco which I have ever tasted.

42. Flavoring substances and perfumes are extensively used in the preparation of tobacco, and I find that the greater number are procurable at a cheap rate in this country. The Tonquin bean is an exception.

43. I am informed that the cost of manufacture in America is (inclusive of interest on capital) about 5*d.* a lb.

Now suppose that selected native cured leaf cost Rupees 8 a maund, or about 1·7 a lb., and cured wrappers 6 Annas a lb., the weight of wrappers to fillers being 1 to 4, 5 lb. would cost 6 Annas + 6 Annas 4 Pies (= 4 × 1·7) = 12 Annas 4 Pies.

If manufacturing cost, say, Rupees 1-4-0 at 4 Annas a lb. (which is more than 5*d.* a lb.), the cost of 5 lbs. would be Rupees 2-0-4, or about 6¼ Annas a lb. = 9¾*d.* a lb. Now I have not the least hesitation in saying that the Gházipur cakes of this year would fetch a very great deal more in India.

In the above estimate I have estimated cost highly, and have not included foreign matter, which on the average costs less than tobacco.

UTILIZATION OF NATIVE TOBACCO.

44. The question how far native-cured tobacco can be utilized requires further inquiry, which I hope will be made during the ensuing season. There is no possibility of establishing a system by which green leaf can be brought from any distance to a central curing house. The leaf must either be cured on the spot or taken to a curing house in the immediate vicinity.

45. The curer pronounces most of the native leaf which he has seen to be coarse, acrid, and in such a broken condition as to be unfit for European manufacture. His remarks refer especially to tobacco produced and cured in the North-Western Provinces. The best he has seen came from Tirhoot.

The curer doubts whether tobacco can be cured up to a good remunerative price, except by a person trained for years to test the condition of leaf by look, touch, and smell. And his belief is no doubt to a great extent correct. It is at the same time a fact that tobacco cured by a planter has been valued at home at a price above 5*d.* a lb.

46. Before any definite opinion is declared upon this point, which is very important, I recommend that a very thorough inquiry be made into the character of tobacco grown and cured in different parts of the North-Western Provinces and Bengal. It is well known that the curing process in East Bengal approaches much more nearly to the European and American method than that in the North-Western Provinces, while both the Tirhoot and East Bengal leaf (Púrabí) has a better reputation than any other Indian tobacco.

47. There appear to be very fair grounds to expect that the best native-cured leaves may be used as fillers for some classes, at any rate, of manufactured tobacco, and also that indigo and other planters may grow and cure, without American superintendence, a better leaf than any which now goes into the market.

48. The expense of raising tobacco in the North-Western Provinces is greater than that in Bengal on account of the necessity of irrigation, and the consequence is that very little tobacco is grown, except where wells are rich in nitrate manures and produce a heavy, large-leaved, and strong-flavored crop. But in some parts of Tirhoot and East Bengal irrigation is very little needed, and cultivation is undoubtedly cheaper there.

49. I propose that I should, and as far as possible that the curer should, during the ensuing season make as thorough examination as we can of the conditions under which tobacco is grown and cured in the North-Western Provinces, Tirhoot, and East Bengal, and especially in the two latter tracts of country; and also that the merits of native-cured tobacco brought to market should receive a more complete investigation than they have had during the past year.

CONCLUSIONS DRAWN FROM FOREGOING STATEMENT.

50. There appears to be every reason to believe, from the experience even of the broken year during which the curer has been in the country (about seven months), that a tobacco can be grown and cured which will compete successfully with American tobacco.

Cured leaf of such quality can be sent to Europe at what will certainly be a remunerative price if curing is done by cultivators or planters (and possibly also even under skilled American supervision). Leaves of good bright gold color and of the proper texture can be cured, which will serve as wrappers, of a class which may be priced at 1*s.* a lb. The cost of cultivation and curing wrappers will be more than that of producing fillers, but the fact remains that good wrappers of the proper texture and quality can be turned out. This is important. Wrappers must be had at any price, even at a loss. Fillers will pay the profits.

One curing house cannot undertake the curing of all the tobacco required for a factory. This is evident from the fact that the area which feeds a curing house must not greatly exceed 100 acres annually under tobacco, or 300 acres of good tobacco land (tobacco being grown once in three years), while a factory requires from 4,000 to 12,000 acres.

51. The profits to be made on curing are not likely to be great enough to induce capitalists to set up curing houses under American skilled supervision simply for the sake of sending cured tobacco to England or to a manufactory.

52. A capitalist who wishes to follow Messrs. Begg, Sutherland, and Co.'s example must in the first instance purchase at least 300 acres of good land, if, as I believe, it is only possible to have one-third under tobacco in one year. He must anywhere in the North-Western Provinces spend Rupees 10,000 to Rupees 20,000 in making wells, or he must pay for wells already made. He must build a bungalow and a curing house at a cost of not less than Rupees 10,000. I estimate roughly that altogether he would have to expend from Rupees 25,000 to Rupees 50,000.

53. I have shown that the margin left for curing, if tobacco sells at 5*d.* a lb., is small, and that the price must certainly be raised to 6*d.* or 7*d.* if any profit is to be hoped for in the North-Western Provinces under skilled superintendence.

54. But if cost of cultivation is reduced and curing is effected by the cultivator or farmer without foreign aid, a very handsome profit may be expected, especially if either the native cultivator or the European planter is able to learn and apply an improved method of curing.

55. The cost of carrying wrappers from outlying curing houses would not be such a heavy percentage on the cost of the manufactured article as the cost of transporting fillers, which ought certainly to be grown in the vicinity of the factory. I believe that the cost of sending tobacco from Gházipur to Calcutta is nearly as great as the cost of freight from Calcutta to London, and it is evident therefore that it is important to have the factory as near as possible to the supply of fillers. It would be absurd to send fillers to Cawnpore, for instance, to be reconveyed after manufacture to Calcutta.

56. I am perfectly assured that the cultivators of no country in the world can produce and cure (on their own system and if left to themselves) cheaper tobacco than the Bengal natives. If, then, it is found that their tobacco can be utilized on the spot in manufacture, profits must exceed profits in other countries so long as the cost of machinery and manufacturing is not greater. I am inclined to believe that these will not be greater since a great deal of hand labor is required in a factory, and hand labor is nowhere cheaper than in Bengal if confined, as it would be, to labor of manipulation.

57. On these broad grounds I am convinced that there is sufficient reason to set about ascertaining the fact whether native leaf in the tobacco-producing districts is good enough, or can be made good enough, to be utilized for manufacturing purposes.

PROSPECTS OF TOBACCO ENTERPRISE.

58. The following is an outline of the system which it appears to me that circumstances require. A large factory or factories should be established in the heart of a tract in which natives are accustomed to grow tobacco, and in which the cost of cultivation is as small as possible. Irrigation must as far as possible be avoided.

59. A small farm and a curing house under skilled American supervision is required for the production of high class leaf, which may be utilized as wrappers.

60. Indigo planters and others should be encouraged to aim at the production of a similar high-class tobacco, either to feed local factories or to export to Europe. They will possibly not succeed in preparing high-class wrappers for some years, but they will at any rate produce (as some of them have already) a *very good* filling leaf.

61. Native-cured tobacco should be utilized, if possible, as fillers. If it is found that natives can be taught to improve their system of curing, through the influence of skilled instruction, so much the better. There is little doubt but that in time it *will* be improved by instructions, but natives are so slow to move that I suspect that for some years their tobacco must be accepted as it is. All that we can do at present is to ascertain where the best tobacco is grown and cured; go there, and utilize it as far as practicable for manufacture.

62. The outline which I have sketched, indefinite as it may be, is sufficiently clear to shadow forth the direction in which progress may be hoped for. The experiments which we are now making form part of a pioneering enterprise, and the first results which we must expect from them are not so much financial success as an indication of the path along which our next steps should be taken, and of the field which our inquiries should now cover. The system which I suggest has, at any rate, the broad basis of experience, since it is practically that which prevails in Virginia, where planters and farmers feed with their produce the neighbouring factories.

COUNTRY BEST ADAPTED FOR FURTHER ENTERPRISE.

63. I regret to state that, as far as my present inquiries have carried me, I do not for various reasons consider any portion of the North-Western Provinces to be so well suited to the establishment of tobacco cultivation, curing, and manufacture as parts of Behar and Eastern Bengal.

64. The rough outline map opposite indicates the area which has been eliminated, I believe, by a process of natural selection as the best tobacco-producing tract of India. Its merits appear to consist chiefly in the following circumstances:—

(1.) It is below the frost line.
(2.) It is moist enough to require but little irrigation and to allow tobacco leaf to be handled with tolerable facility.
(3.) It is the coldest part of India which satisfies the above conditions.

The first two circumstances require no explanation. I must say a word or two about the last.

65. The Virginia curer is satisfied by his American experience that the best flavored tobacco for smoking is grown in a cool, temperate region. He states confidently that this is a recognized fact in his country, and that whatever may be the case as regards cigar tobacco, a moderately cool climate produces a better smoking and chewing leaf than the more tropical regions. His own instincts, derived from his knowledge of facts, lead him to prefer a somewhat hilly tract of land.

66. If this view is accepted (and it is borne out by the analogous case of European vegetables, peaches, and other exotic produce, which acquire a much better flavour in the northern than in the southern limits of their growth), it becomes apparent why the tobacco already most valued in the market should be that which comes from Tirhoot and East Bengal. The weather from November to February, when tobacco is growing to maturity, is in that tract cool and temperate. It is certainly a fact that tobacco is grown in some parts of this region over enormous areas, and that in travelling through it a tobacco field is as ordinary a sight as a wheat field in the Doab of the North-Western Provinces, where the plant can only be found hugging rich nitrate wells or forced up on the heavily-manured suburban lands of large towns.

67. It may be argued that if the theory about climate is correct, it will be well to try further north still. The answer is that the attempt will be barred by frost and extreme dryness. I am of opinion certainly that tobacco may do very well in the eastern districts of the North-Western Provinces, which are adjacent to Bengal, and perhaps also along the belt of land underlying the Himalayas (both in the North-Western Provinces and Oudh), which tracts are not affected by great aridity of climate. But the extension of tobacco cultivation in this direction must be a work of a time, and at present it will be extremely undesirable to add to other difficulties the greatest difficulty of all, *viz.*, the introduction of tobacco-growing on a large scale amongst an agricultural community who have never tried it. The cultivation of tobacco is not like that of indigo, a simple matter. The greatest care, skill, attention, and labor are necessary to its successful production.

68. The only section of the North-Western Province land in which I have personal knowledge of anything approaching to constant and extensive tobacco cultivation is the suburban area of Farukhabad. There are similar areas (though I doubt if they are so large) round Meerut and Jaunpur, and perhaps round some other large towns with which I am not acquainted. Farukhabad is probably pre-eminent amongst them, and there I have good reason for believing that less than 1,000 acres are under cultivation annually, while I do not think that cultivation could be extended outside the suburban and highly manured ring of land. There is therefore no prospect of finding any field there for a large factory, nor any hope of an encouragment of the town cultivation acting as a leaven to the district in which difficulties of climate, irrigation and manure prevent tobacco-growing on a large scale. A further objection is that the tobacco raised on town land is of the nitrogenous and highly acrid class, which is unsuitable for European manufacture. But the strong acrid leaf which finds so much disfavor in a European market fetches in India a good price, often Rs. 8 to Rs. 10 a maund, on account of the very qualities for which it is disliked at home. It is not likely therefore that the cultivators would readily substitute the American method of cultivation, which would not permit either the use of so much nitrogenous manure or the production of a very heavy crop, unless they were compensated by what would probably prove an excessive price.

69. These are the reasons why I doubt whether much can be done with suburban tobacco patches of the North-Western Provinces, and why I recommend that pioneering enterprise should first seek the tobacco country of Tirhoot and East Bengal. I regret much that I should feel myself obliged to suggest any measure which would tend to lead tobacco enterprise out of the North-Western Provinces, but I feel that in the cause of tobacco progress I am right.

PROPOSALS AND SUGGESTIONS FOR THE CONSIDERATION OF GOVERNMENT.

70. If Government accept the view that the course which I have indicated is likely to be the proper one to pursue, the first step which should be taken is, in my opinion, the critical examination of the tobacco of Tirhoot and Bengal and the conditions under which it is grown and cured.

71. For this purpose I would ask permission, with the concurrence of the Bengal Government, to visit any part of the Tirhoot and Bengal country in which I may consider inquiry desirable. With the consent also of Messrs. Begg, Sutherland and Co., I should recommend that the curer be allowed to accompany me whenever he can be spared from his duties at Ghâzipur.

72. If conditions are found to be favorable to the adoption of the programme which I have suggested, I should recommend Government to propose to Messrs. Begg, Sutherland & Co. that they should take measures to establish a factory in a suitable locality.

73. If Messrs. Begg, Sutherland & Co., absolutely decline to co-operate with Government in making inquiries or to entertain the idea of establishing a factory, I would in that case only recommend Government to take independent steps to make the necessary inquiries and to invite the co-operation of other capitalists, whether Indian or American, in undertaking the enterprise.

74. It is due to Messrs. Begg, Sutherland & Co. to make to them the first offer, and to support them throughout in keeping the lead which they have taken, if they still wish to keep it. I have not consulted Messrs. Begg, Sutherland & Co. upon the questions raised in this note, which I have written simply in accordance with the conclusions at which the facts before me have led me to arrive, but I should think that they are likely to adopt much the same conclusions from a consideration of the same series of facts.

75. Ghâzipur is the first experimental platform upon which we have made a stand, in order that a better out-look might be obtained of the future prospect of the North Indian tobacco. The enterprise must not, however, be long confined within such a narrow circle, nor must its future success be gauged merely by the result of the Ghâzipur concern. There are difficulties there in the matter of irrigation and novelty of cultivation which would be removed in Bengal.

76. I do not now suggest any immediate action beyond the continuance of operations at Ghâzipur; but if the inquiries which I now propose are found to bear promising results, I will then recommend further advance of the character which I have described.

77. The declining condition of the indigo trade has made planters ready to accept any chance of improving their position by a new industry connected with agriculture. They are, I am credibly informed, quite prepared to take up with alacrity the cultivation and preparation of tobacco, if they are informed of the circumstances under which it will pay them to do so. And they are probably aware of the fact that tobacco and indigo could be cultivated and prepared side by side with great advantage. Tobacco can be raised on indigo refuse, and come into the curing house, which is ready to hand in the indigo godown, just after indigo has left it.

78. If, then, Messrs. Begg, Sutherland & Co. accept any proposal which may be made to establish a factory, I am of opinion that the wisest thing they could do would be to encourage tobacco-growing and curing by an intelligent body of gentlemen, who would succeed far sooner in raising the article required by the trade than the ignorant and conservative natives. In any case the demand for tobacco is so enormous that competition in India, so far from being feared, should probably be welcomed, as tending to advertise and increase the East Indian trade.

79. I continue to advise the prosecution of the Gházipur experiment. It is as favorable a place for the curer to conduct his first attempts as any which can be found, and may turn out very useful as a place in which to produce leaf of a high class, such as natives and planters may not be able to cure. The Korantadhi stud buildings may eventually be utilized for a similar purpose, and for that reason I have suggested the retention for the present of some of the stables.

80. In conclusion, I wish to place before Government this question for their consideration. If conditions prove to be sufficiently favorable for the establishment of a tobacco factory in North India, what encouragement is Government prepared to give to it? I do not myself consider that any assistance of a positive character is necessary. I do, however, strongly advise that a distinct promise should be given that no export duty will be charged, say for a period of 20 years, and that no inland revenue will be charged, say for a period of 10 years. I do not think that any measure would conduce to the speedy advance of the enterprise so much as a promise of this nature, and one reason why I have described at such length the circumstances connected with the possible future of the trade is, that Government may have ample time to consider what form of encouragement they will be ready to give to it when the time comes to ask them for assistance.

ENCLOSURE No. 2.

From E. C. BUCK, Esq., Director of Agriculture and Commerce, North-Western Provinces, to the Secretary to the Government, North-Western Provinces, dated Allahabad, 10th November 1876, No. 834-A—XXII-25.

IN continuation of my note on tobacco cultivation at Gházipur and in the North-Western Provinces (No. 806-A, dated 18th October), I have the honor to make the following supplementary report.

2. When I received charge of this department, His Honor Sir John Strachey desired me to make all possible inquiries regarding the practicability of growing, curing, and manufacturing tobacco in these provinces for European consumption, and to propose any plans which might appear to be feasible for the furtherance of this object.

3. The Gházipur experiment was the first result of the instructions which I received. I promised, however, when I set on foot operations at Gházipur to extend my inquiries to other parts of the North-Western Provinces.

4. The only tracts in the provinces which appeared to me to be free from the objections of the extreme dryness and frost of the North-Western plains were the Sub-Himalayan Tarái, including the Dún and Himalayan region proper.

5. I have not yet had the opportunity of fully ascertaining what are the conditions in the Dún and Tarái, but I have made careful inquiries at Kumaun.

6. In the first place it must be explained that the season in the hills differs entirely from the season in the plains. In the former (the hills) tobacco is sown in March and cut in October, and in the latter (the plains) is sown in October and cut in March. The hill season is therefore free from frost.

7. A year and a-half ago I sent some Virginian tobacco-seed to Mr. Troup of Ranikhet and to Mr. Craw of Dunagherie, who had both kindly volunteered to try experiments for me. Mr. Troup sowed the seed at Ranikhet, but was prevented by severe illness from prosecuting any curing experiments. The tobacco, however, grew up and sustained the climate so well that it disseminated itself over jungle land in the proximity, where healthy plants are now growing in a wild state. Mr. Craw both grew the plants and cured the leaf, which proved to turn out a tobacco of good quality.

8. In October last, I obtained the permission of Messrs. Begg, Sutherland, to bring to Kumaun Mr. Williamson of Virginia, who is in their employ as curer at Gházipur, and whose health had there suffered. He accompanied me to Ranikhet and visited Dunagherie.

9. He gives a decided opinion on the following points:—The climate is better than that of the plains for growing and curing a fine-flavored tobacco, and is in many respects like that of Virginia. The plants grown by natives as well as those on Mr. Troup's estate are of very promising quality, and the fact of the plant growing wild indicates the suitability of the climate. The tobacco cured by Mr. Craw is of good quality and of fine flavor, though it has lost much strength by hanging too long. The night weather of October and November, after the rains have cleared off, is perfect for curing—exactly the weather, in fact, which is most desired in Virginia during the curing season. Forest soil with good vegetable mould is the best that can be had for tobacco, and is superior to land manured chiefly with organic matter. Mr. Williamson believes that land suited for tea will be found suited for tobacco. He strongly advises attempting tobacco culture in the hills if sufficient land can be found for the purpose.

10. Mr. Williamson himself is unable to leave Gházipur, where he is prosecuting Messrs. Begg, Sutherland's enterprise under a three years' contract. He informs me, however, that through his relations and friends in America, who are all connected in some way with tobacco interests, he will have no difficulty in procuring a thoroughly trained Mulatto for a salary not exceeding £100 a year, who would be quite capable under European supervision of taking the position of overseer on a tobacco estate just as a Chinaman does on a tea estate.

11. I may here notice that the principal difficulty hitherto encountered in promoting tobacco enterprise in this country has been that of procuring the services of skilled curers and manufacturers. Many a planter and resident of India has appreciated the vast capabilities of tobacco as a remunerative article of commerce, but no one has known how to bring it to the European market in a proper condition. What success Messrs. Parrot and Skinner had in Bijnor was attributed by the settlement officer to their "having caught a Cuban sailor." No thoroughly experienced tobacco curer, however, has hitherto been brought to the country until the arrival of Mr. Williamson, and I am strongly of opinion that such opportunities as now offer themselves ought not to be lost of increasing the number of men skilled in the trade until a sufficient supply has been introduced into the country for the instruction of our planters and cultivators. When once the requisite knowledge and skill has been acquired in India, the industry will carry itself on in the same way as has the cultivation and preparation of tea.

12. In a conversation which His Honor Sir George Couper was pleased to permit me to hold with him on the subject, His Honor suggested that if Government brought out a curer with whose services it might be found afterwards desirable to dispense an indigo planter might take him into his service. I feel almost sure that there would be no difficulty in so disposing of him, because, as I have stated in my previous note, indigo planters are, in the face of the decline of indigo, only too anxious to take up a new industry of so promising a character as tobacco.

13. We have during the past year and a-half done all that can be done of a preliminary character. The plant has been grown and cured and found to succeed to a sufficient degree to justify further steps, and the only step which it is now possible to take is to procure a skilled curer and manufacturer.

14. The proposition which I place before Government is this—

(1.)—That Mr. Williamson be asked to procure a Mulatto curer;
(2.)—That suitable land be chosen in Kumaun;
(3.)—That the experiment be placed under the charge of some responsible officer.

15. The reasons why a "Mulatto" is named are that, on the one hand, an American is much more expensive than a Mulatto, and on the other that negroes are unwilling to leave the place in which they have been brought up. It is necessary to accept Mr. Williamson's assertion that a thoroughly trained Mulatto can be procured. He should receive immediate authority to apply for one, as the curer would be required as soon as possible after March, when the seed will be put in the ground.

16. I am unable to give any distinct suggestions as to the locality in which the experiment should be tried. The area ought not to be less, and may be much more, than 200 acres, and should be of the same class as land chosen for tea. The most suitable elevation would, I believe, be from 4,000 to 6,000 feet, as in both Dunagherie and Ranikhet the plant grew well. Irrigation is an advantage, but not indispensable, as the chief growth is made by the plant in the rains. Some land is said to be available near Lobar, and from what I hear of it, it is not improbable that it could be found suitable.

17. The choice of the officer under whom the experiment should be placed would depend somewhat on the locality chosen. Mr. Tengelly, Forest Officer of Ranikhet, and Mr. Craw, of Dunagheri, have been mentioned to me, but I doubt if the latter gentleman's services would be available.

18. On the questions named in paragraphs 16 and 17, the advice of the Commissioner of Kumaun will be requisite. I presume, indeed, that the Commissioner will be consulted upon the whole proposition brought forward, and that any steps which may be taken, will be taken only with his concurrence.

19. I ought to have brought to notice the fact that tobacco cannot be grown consecutively on the same land each year, and that (as I have explained indeed in my former note) it is never the sole, though it may be the chief, product of a so-called tobacco farm in America. I am told, however, by Mr. Williamson that it is often grown between rows of orchard trees, which are improved by the loosening of the soil. In considering what should be the alternative cultivation in Kumaun, I have come to the conclusion that the safest measure to take would be to plant rows of tea bushes at double the ordinary interval, and cultivate tobacco in alternate intervening spaces in alternate years. The estate would then be growing in value as a tea plantation, and could be sold by Government as such on the completion of the experiment. If this course were adopted, the experiment might be economically conducted under the management of some trustworthy person skilled in the work of a tea plantation. I have no doubt that such a person could be found. I wish to make it plain that, while it would be waste of time and money to grow tobacco *alone*, it would be useless for a European to attempt the cultivation of ordinary native crops, and that the only alternative is tea. Moreover, tea-curing and tobacco-curing being carried on in the hot and cold weather respectively, the hands employed in the one can be retained for the other.

20. I took the opportunity when in Ranikhet of visiting the Canteen of one of the European regiments at that station for the purpose of examining the tobacco supplied to the men. The Canteen Sergeant informed me that it was not liked, and indeed that it was not smoked except by the older hands, the young ones preferring to spend 5 or 6 Annas a day in cigars, as the tobacco supplied was too strong and rank. I showed a specimen to Mr. Williamson, who at once recognized it as a class of tobacco "put up and doctored for chewing and not for smoking," and not only that, but "as belonging to the worst class of chewing tobacco, such as is used by negroes and whites of the lower classes." Its cost to the soldier is 14 or 15 Annas a pound. It seems to me impossible not to believe that smoking such tobacco is injurious to the health, and that if, as I believe probable, a really good and wholesome native-grown tobacco can be supplied to the troops at about a rupee a pound, it will be advantageous to Government, as a matter of military economy, to procure it in India. I am able to assure Government that on the evidence of two or three smokers the tobacco roughly manufactured at Ghâzipur is of good and pleasant flavor and has indeed been regularly smoked for weeks by one or two gentlemen residing in Ghâzipur; if Mr. Williamson's prognostications are true that a better tobacco can be manufactured in the hills, it will certainly be of a class that will approve itself to the British soldier.

21. This leads to the question of manufacture. Mr. Williamson states that if manufacturing is confined to a single class of cake (such, for instance, as is found to suit the soldier's taste) it will be quite practicable to manufacture with hand-presses and appliances such as could be constructed in an ordinary carpenter's shop, and that it will not be necessary (at any rate unless the plant is grown on a very large scale) to set up any extensive machinery. I have asked Mr. Williamson whether a curer can be obtained who understands manufacturing as well as curing, but, though I have not received his answer, I am doubtful whether it will be possible to do so. Mr. Williamson himself understands both processes; but he has informed me that he is an exception, and I am aware that considerable trouble was taken in America to find for Messrs. Begg, Sutherland a Manager who was equally well acquainted with all branches of the trade. But a great deal of information can be supplied by Mr. Williamson, who may also, with Messrs. Begg, Sutherland's permission, be allowed to make experiments in manufacturing the leaf cured in the hills. If the result is successful, it will be worth while either to have a man educated by Mr. Williamson or to procure another Mulatto from America.

22. I request the favor of an early reply, so that, if the experiment is to be tried at all, another year may not be lost.

ENCLOSURE No. 3.

From E. C. BUCK, Esq., Director, Department of Agriculture and Commerce, North-Western Provinces and Oudh, to the Secretary to Government, North-Western Provinces and Oudh, dated Allahabad, 6th May 1878, No. 628A-LVI.

I have the honor to reply to G.O., No. 200-A, dated 21st January, calling for a further report on tobacco operations under the control of this department, for which I have only now received requisite statistics from Ghâzipur and Pusa. I will take up the history of the enterprise from the point at which I left it in my letter No. 806-A, dated 18th October 1876.

2. In 1876, *i.e.*, the first season after his arrival, 52½ acres were cultivated at Ghâzipur, under the superintendence of the Virginian curer, Mr. Williamson; the tobacco was sown in July and August, and was growing at the time when my report was submitted. In a second letter,

No. 834-A, dated 10th November 1876, I reported that I had taken Mr. Williamson to inspect Kumaun, with a view to obtaining an opinion on the probability of success in growing tobacco in Kumaun.

3. I take the opportunity here to state that the progress of operations has been greatly imperilled by the condition of Mr. Williamson's health. He worked very hard, and exposed himself very much to sun and heat in 1876; and when I took him to the hills in October of that year I did so partly because he was unwell at Ghâzipur—so much so that I had some difficulty in persuading him to stay in the country. His health was somewhat restored by his visit to the hills, but at the commencement of the hot weather in 1877, he became so ill that I advised Messrs. Begg, Sutherland to allow him to go to sea; and in May and June he travelled to and from Java, where he had the opportunity of inspecting tobacco estates in that island. As the failure of Mr. Williamson's health appeared likely to entail the break-down of the whole experiment, Messrs. Beg, Sutherland took the wise and energetic step of arranging for the engagement of a second curer from Virginia, who arrived towards the end of the hot weather. Meanwhile, Mr. Williamson returned in better health, and was able to carry on, until October 1877, when he again broke down, and I was obliged to send him, with Messrs. Begg, Sutherland's permission, again to the hills, where he recovered sufficiently to permit him to work through the cold weather until March of this year, when, by his own wish, and under my recommendation, confirmed by medical advice, Messrs. Begg, Sutherland permitted him to return to America on six months' leave. The firm have generously defrayed his expenses, and have taken advantage of his enforced return to entrust him with a commission to procure machinery for tobacco and cheroot manufacture, as well as to obtain further information regarding American processes.

4. I have mentioned in the last paragraph the engagement of a second curer. Messrs. Begg, Sutherland were encouraged to take this step by the favorable reception of their application to His Honor the Lieutenant-Governor of Bengal for the establishment of a second tobacco farm at Pusa. My conviction that Upper Bengal was a far more favorable country for the development of tobacco industry than any part of the North-Western Provinces were fully stated in my former report, and were so strong that I took the step of requesting the favor of an interview with Mr. Eden, with the view of representing the desirability of allowing Messrs. Begg, Sutherland to establish a second farm at Pusa. His Honor the Lieutenant-Governor of Bengal kindly listened to my representations, and after some correspondence on the subject, was good enough to accede to Messrs. Beg, Sutherland's application; and the second curer, Mr. Cabaniss, arrived just in time to plant with tobacco a considerable area at the Pusa farm.

5. Meanwhile I had, in January 1877, placed at Ghâzipur an apprentice, Mr. Caine, partly with the object of his affording assistance to Mr. Williamson, who greatly needed it, and partly with the object of allowing some knowledge of tobacco-curing to be acquired by an European in this country, in case of extending operations. Mr. Caine was, however, in February last (1878) transferred from Government service to that of the firm, who have placed him as an assistant to Mr. Cabaniss, at Pusa, where he will be more usefully employed than he could be elsewhere. During Mr. Williamson's absence, Mr. Wishart, a member of the firm, is holding charge at Ghâzipur. Operations at Ghâzipur and Pusa are now conducted, therefore, entirely under the control and at the expense of Messrs. Begg, Sutherland, & Co.

6. The correspondence which passed between Messrs. Begg, Sutherland and the Government of Bengal, and the terms on which Pusa was made over to them on lease, are not available in this office, but are, I presume, in the Secretariat of the Government of India.

7. The crop of 1876, 52½ acres, was cut and cured early in 1877. My predictions as to the danger attending tobacco cultivation in any part of the plains north of Bengal, were, however, confirmed by the occurrence of a severe hailstorm, which did much damage to the plant and reduced its market value, according to the firm's estimate, by "fully one-third." The following statistics and information as to the disposal of the crop are given by the firm.

Twenty acres were cultivated by the firm under their own management and 32½ acres by cultivators on their behalf. The outturn was nearly lbs. 59,000, exclusive of the second cutting of the cultivators' crops, which they were allowed to keep themselves.

The crop has been disposed of in the following way:—

20 acres private cultivation.
32½ ditto Asamiwar.
52½ acres which have given, including the Kountee crop from the private cultivation, about 59,000 lbs., viz.—

	Lbs.	Lbs.
Refuse tobacco sold to native dealers	10,000	..
Second cuttings of home farm crop cured by natives	12,000	..
Hail-broken leaves		22,248
Refuse tobacco in stock, hail-broken leaves, estimated		2,000
Stems in stock ditto		4,000
Strips shipped to England		8,882
Leaf ditto		881

	lbs.
Strips in stock to be manufactured, estimated	1,500
Handed leaf in stock ditto ditto	500
Loose leaf in stock ditto ditto	500
Black Cavendish fillers in stock to be manufactured	11,000
Medium bright ditto ditto	1,500
Leaf manufactured into black Cavendish and medium bright smoking tobacco in stock.. ..	5,700
	58,711

8. The history of the next season, 1877-78, at Gházipur is the record of a series of troubles. I have indicated what I may really term the difficulty of keeping the curer alive. It was even more difficult to keep the plant alive, Gházipur having suffered perhaps more than any part of the North-Western Provinces from the severity of the calamitous drought, while, again, my predictions as to frost were confirmed by severe cold in January. Sixty acres were, however, kept going, and the outturn in cured leaf will be about the same as in 1876 (from 50,000 to 60,000lbs.); but the firm report "that the quality of leaf is not so good, owing to the almost entire failure of the rains." About three-fourths of the crop have been cured on the American system, and one-fourth in the ordinary native way, and is now stored in the houses on the farm. Whether it will be manufactured or sent home as cured leaf depends on the circumstances to which I refer below in my 11th and 12th paragraphs.

9. Luckily Pusa lay beyond the circle of severe drought, and the new curer was able to bring 200 acres under cultivation. He found cultivators accustomed to rear the plant, and not, as in the North-Western Provinces, new to the work, and had far fewer difficulties to overcome than Mr. Williamson had to face at Gházipur. The crop has been in the last month or two cut and cured, and the firm report, on the authority of the curers, that the leaf will compare favorably with a good deal of the low grade American tobacco that sells in England at from 4*d.* to 8*d.* per lb. The outturn of cured leaf is estimated at 150,000 to 175,000lbs., of which the firm propose to ship about 100,000 to England in the leaf state, and to manufacture the balance next year.

10. In answer to a reference made by me to Messrs. Begg, Sutherland, I have obtained the following opinions by the two curers, on the prospects of the industry:—

"Mr. Williamson is of opinion that the tobacco grown here (Gházipur) in the seasons of 1876 and 1877 would fetch about 4*d.* per lb. in the English market, but that with fairly good seasons he will be able to produce leaf that will sell for a much higher price. He considers that the lot of tobacco that was cut in December 1876, before the hail came, would bring 7*d.* per lb. in England, in spite of the general prejudice that exists against Indian tobacco; and he feels confident that with an average Indian season, he will be able to produce a class of tobacco that will meet all the requirements of the English market. As regards manufacturing, he is of opinion that if the enterprise is properly backed up by all the parties interested in it, that there is a great future for the trade. He has already manufactured some black Cavendish, which he considers in every respect as good as the bulk of black Cavendish exported from America; and if American manufacturers could see it, they would feel that they had formidable rivals to contend with in India."

"Mr. Cabaniss has hardly been long enough in the country to enable him to form an opinion as to what can be done in tobacco at Pusa; and as he has not yet completed the curing of the crops he cannot make an estimate of his market value: he, however, considers that the bulk of the crop now being cured will suit the English market, and that it will sell for a much better price than any Indian tobacco has sold for in England. He further adds that, from what little he has seen of the climate at Pusa, he thinks that the place is very suitable for tobacco cultivation, on the American system, and that he will be able in course of time to produce tobacco that will compare favorably with the Virginia leaf. The manufacturing machinery for Pusa has not yet been got out from America, and Mr. Cabaniss has not made any experiments in manufacture, but he is of opinion that he could make good black Cavendish from the crop now being cured."

11. I have referred in some of the preceding paragraphs to "manufacture." When my last report was submitted, proceedings had not reached this stage, and it was not then known whether, as in the case of Java and other tobacco-producing countries, it would not be advisable to restrict operations to the export of cured leaf for manufacture in England. At the same time the firm decided to make, on a small scale, experiments ("not in cheroot making, which is not a speciality of the Virginian trade," but in the manufacture of cake tobacco, such as golden leaf, Cavendish, &c., for which there might be at any rate some demand in this country, if not abroad). Messrs. Begg, Sutherland accordingly imported some hand-press machinery from America, and fitted up a small factory at Gházipur, and, beginning to manufacture in December last, have now turned out some 3,000 or 4,000 lbs. of black Cavendish, which is certainly as good as, and in my opinion better than, a great deal of the same class of tobacco used by troops. Samples will shortly be circulated to regiments.

12. If this part of the enterprise is successful, and a market is obtained for manufactured tobacco in Europe and the colonies, profits will undoubtedly be so large as to induce a great

extension of the industry. As in the case of tea, Indian manufacturers, beating other competition in the labor market, will find their best security in freedom from adulteration, and will be induced, for their own advantage, to supply a pure, wholesome article, which (if the leaf, properly cured and manufactured, is found palatable) must gain favor among smokers, and it may be hoped that the almost unlimited markets of Europe and the Colonies will eventually accept the tobacco made in this country.

13. The position in which the enterprise now stands may be briefly expressed as follows:—Government and the firm whom they have enlisted in the enterprise have spared no trouble and expense in completing preliminary trials in the face of many difficulties. The experiment promised of attempting the introduction of the American system of curing and manufacturing has been fully carried out; every part of it has succeeded; a professional verdict has been given in favor of the results, and all that is now required is the acquiescence of the public in the opinion of the curers that the tobacco is fit for them to smoke.

14. Government, I need hardly say, both in India and at home, can greatly assist in establishing a market by introducing the tobacco to the favorable notice of army and navy authorities, upon whom the fact should be impressed that the very cheap tobaccos obtained on contract from America are the poorest portions—the dross, as it were, of the crop of that country; whereas the still cheaper tobacco which can now be given from India is carefully selected as the best of the outturn. A certain amount of prejudice has doubtless to be overcome, for British soldiers and sailors are conservative in their tastes, and I therefore recommend that some means may be taken to secure at starting an unbiassed and unprejudiced opinion on the merits of the tobacco and deprecate any attempt to force it upon smokers, military or naval.

15. I despatched on the 6th April 1878, a case of tobacco manufactured at Gházipur, to be forwarded to Her Majesty's Secretary of State for India, and containing the following samples:—

1 Box	containing	8 cakes black Cavendish, weighing 2lbs., value 7 Annas per pound.	
1 ,,	,,	3 ,, Gházipur smoking mixture, weighing 2 lbs., 1 Rupee per pound.	
1 Tin	,,	¼ lb., loose cut Gházipur smoking mixture, 12 Annas per pound.	
1 Box	,,	13 cakes medium bright 12-inch tobacco, weighing 4 lbs., value 12 Annas per pound.	
1 ,,	,,	8 ,, ,, 8-inch tobacco weighing 2lbs., value 12 Annas per pound.	

The severity of the drought impaired the character of Gházipur leaf, and the specimens forwarded are inferior to what will be in future turned out, especially as improved machinery will be sent out this year from America by Mr. Williamson.

16. Messrs. Begg, Sutherland are fully prepared to establish a factory on a large scale, either at Pusa or (as is more likely) at Calcutta, as soon as they see a probability established of obtaining a market, and they are anxiously looking to the results of the present season to decide their fate. I cannot speak too highly of the energy and thoroughness with which this firm have prosecuted their undertaking and brought the enterprise to its present position. No one who has not as I have been closely associated with them can understand the trials, difficulties and worries which they have had to meet and overcome. I must add that had not the Government of the North-Western Provinces been good enough to give me entire freedom of action in affording the firm assistance and advice, I doubt very much whether the difficulties would have been overcome.

17. I have now to refer to my supplementary project of attempting the introduction of tobacco cultivation in Kumaun. In accordance with G.O., (No. 2133-A, of 1876, dated 7th December), I placed myself in communication with the Commissioner of Kumaun, who selected land near Almora early in 1877, and I decided, pending the clearing of the land, to make an experimental trial of tobacco in three or four acres at Ránikhet, under the supervision of Mr. Troup, planter of that place, who appeared to take an interest in tobacco cultivation. Meanwhile, I requested Mr. Williamson, the Gházipur curer, to write about a Mulatto.

18. No part of the scheme succeeded. Later in the year the Commissioner of Kumaun reported that the selected land was found to contain insufficient good soil. The drought seriously injured the tobacco, and the answer from America was unfavorable to the importation of a Mulatto.

19. When it became necessary on account of his health to send Mr. Williamson to the Himalayas in October (the curing season of the hills), I requested him to cure Mr. Troup's crop. The plant, however, had suffered so much that the experiment was not satisfactory. Added to which the Gházipur firm telegraphed that rain having unexpectedly fallen, it was at last possible to cure the leaf at Gházipur, which had been for several months left hanging in the curing-house in the vain expectation of moist weather. I was obliged, therefore, to send back the curer to Gházipur as soon as he was well enough, and Ránikhet operations were interrupted. This is another, though small, instance of the disturbing influence of the drought of 1877.

20. For the present year I have obtained the permission of the forest authorities to grow, under the supervision of the Superintendent of the Ránikhet forest nursery (Mr. Craw), four acres of tobacco. The Commissioner of Kumaun has selected other land for future trials, which

he wishes me to inspect this year, and Messrs. Begg, Sutherland have promised to spare the services of one of their curers to cure the Ránikhet crop in October, which, as a cheap curer cannot be procured from America, is the best plan to pursue for the present.

21. I may add that the Commissioner of Kumaun is anxious that the land chosen should be utilised for the establishment of fruit orchards and other useful purposes, and that preparations have been made to grow stock to furnish the estate as soon as the land is chosen. Any expense, therefore, that will be incurred on tobacco will be shared and probably recouped by other operations which have for their object the increase of the food supply of the country. I agree with the Commissioner in believing that it will be possible, and, if so, very desirable, to effect on a large scale the exportation of apples, which have now been proved to succeed so well in the Himalayas, to the plains.

22. During the time that the curer, Mr. Williamson, has been in the country, I have lost no opportunity of obtaining from him detailed information on the subject of tobacco-curing, which I have of course also seen in operation at Gházipur. I have collected the information so obtained in a pamphlet, of which a revised edition has lately been published, and of which I append ten copies. The pamphlet has been freely supplied to planters and any others who have asked for it, and a certain amount of information on the subject has thus been distributed over the country.

23. Planters throughout the north of India are watching the results of Messrs. Begg, Sutherland's enterprise with great interest, and as soon as they are satisfied that success is obtainable, will, I am assured, in many cases follow their lead. I am very much inclined to doubt, however, whether great success will be obtained by any imitators unless their action in importing skilled curers from America is copied. Tobacco curing cannot be taught only by book any more than any other trade requiring skill in manipulation and practical experience.

No. 10. ORDER THEREON, 2nd August 1878, No. 1212.

Miscellaneous.

FORWARDED to the Board of Revenue for communication to the Superintendent, Government Farms.

(A true Extract.)

C. G. MASTER,
Secretary to Government.

To the Board of Revenue.

Exd. W. H. French.

No. $\frac{628A}{LVI.}$ of 1878.

From

THE DIRECTOR, DEPT. OF AGRI. AND COMMERCE,
NORTH-WESTERN PROVINCES AND OUDH,

To

THE SECRETARY TO GOVERNMENT,
NORTH-WESTERN PROVINCES AND OUDH.

Dated Allahabad, the 6th May, 1878.

SIR,

I HAVE the honour to reply to Government Order No. 200A, dated 21st January, calling for a further report on tobacco operations under the control of this department, for which I have only now received requisite statistics from Ghâzipur and Pusa. I will take up the history of the enterprise from the point at which I left it in my letter No. 806A, dated 18th October, 1876.

2. In 1876, *i.e.*, the first season after his arrival, 52½ acres were cultivated at Ghâzipur, under the superintendence of the Virginian curer, Mr. Williamson; the tobacco was sown in July and August, and was growing at the time when my report was submitted. In a second letter, No. 834A, dated 10th November, 1876, I reported that I had taken Mr. Williamson to inspect Kumaun, with a view to obtaining an opinion on the probability of success in growing tobacco in Kumaun.

3. I take the opportunity here to state that the progress of operations has been greatly imperilled by the condition of Mr. Williamson's health. He worked very hard, and exposed himself very much to sun and heat in 1876; and when I took him to the hills in October of that year I did so partly because he was unwell at Ghâzipur—so much so that I had some difficulty in persuading him to stay in the country. His health was somewhat restored by his visit to the hills, but at the commencement of the hot weather in 1877, he became so ill that I advised Messrs. Begg, Sutherland to allow him to go to sea; and in May and June he travelled to and from Java, where he had the opportunity of inspecting tobacco estates in that island. As the failure of Mr. Williamson's health appeared likely to entail the break-down of the whole experiment, Messrs. Begg, Sutherland took the wise and energetic step of arranging for the engagement of a second curer from Virginia, who arrived towards the end of the hot weather. Meanwhile, Mr. Williamson returned in better health, and was able to carry on until October, 1877, when he again broke down, and I was obliged to send him, with Messrs. Begg, Sutherland's permission, again to the hills, where he recovered sufficiently to permit him to work through the cold weather until March of this year, when, by his own wish, and under my recommendation, confirmed by medical advice, Messrs. Begg, Sutherland permitted him to return to America on six months' leave. The firm have generously defrayed his expenses, and have taken advantage of his enforced return to entrust him with a commission to procure machinery for tobacco and cheroot manufacture, as well as to obtain further information regarding American processes.

4. I have mentioned in the last paragraph the engagement of a second curer. Messrs. Begg, Sutherland were encouraged to take this step by the favourable reception of their application to His Honour the Lieutenant-Governor of Bengal for the establishment of a second tobacco farm at Pusa. My conviction that Upper Bengal was a far more favourable country for the development of tobacco industry than any part of the

North-Western Provinces were fully stated in my former report, and were so strong that I took the step of requesting the favour of an interview with Mr. Eden, with the view of representing the desirability of allowing Messrs. Begg, Sutherland to establish a second farm at Pusa. His Honour the Lieutenant-Governor of Bengal kindly listened to my representations, and after some correspondence on the subject, was good enough to accede to Messrs. Begg, Sutherland's application; and the second curer, Mr. Cabaniss, arrived just in time to plant with tobacco a considerable area at the Pusa farm.

5. Meanwhile I had in January, 1877, placed at Gházipur an apprentice, Mr. Caine, partly with the object of his affording assistance to Mr. Williamson, who greatly needed it, and partly with the object of allowing some knowledge of tobacco curing to be acquired by an European in this country, in case of extending operations. Mr. Caine was, however, in February last (1878), transferred from Government service to that of the firm, who have placed him as an assistant to Mr. Cabaniss, at Pusa, where he will be more usefully employed than he could be elsewhere. During Mr. Williamson's absence, Mr. Wishart, a member of the firm, is holding charge at Gházipur. Operations at Gházipur and Pusa are now conducted, therefore, entirely under the control and at the expense of Messrs. Begg, Sutherland, and Co.

6. The correspondence which passed between Messrs. Begg, Sutherland and the Government of Bengal, and the terms on which Pusa was made over to them on lease, are not available in this office, but are, I persume, in the Secretariat of the Government of India.

7. The crop of 1876, 52½ acres, was cut and cured early in 1877. My predictions as to the danger attending tobacco cultivation in any part of the plains north of Bengal, were, however, confirmed by the occurrence of a severe hailstorm, which did much damage to the plant and reduced its market value, according to the firm's estimate, by "fully one-third." The following statistics and information as to the disposal of the crop are given by the firm.

Twenty acres were cultivated by the firm under their own management and 32½ acres by cultivators on their behalf. The outturn was nearly lbs. 59,000, exclusive of the second cuttings of the cultivators' crops, which they were allowed to keep themselves.

The crop has been disposed of in the following way :—

20 acres private cultivation.
32½ ditto asamiwar.
52½ acres which have given, including the Kountee crop from the private cultivation, about 59,000 lbs., viz. :—

	lbs.	lbs.
Refuse tobacco sold to native dealers	10,000	
Second cuttings of home farm crop cured by natives ...	12,000	
Hail-broken leaves	...	22,248
Refuse tobacco in stock, hail-broken leaves, estimated ...	...	2,000
Stems in stock ditto ...	...	4,000
Strips shipped to England	...	3,882
Leaf ditto	...	881
Strips in stock to be manufactured, estimated ...	...	1,500
Handel leaf in stock ditto ditto	...	500
Loose leaf in stock ditto ditto	...	500
Black Cavendish fillers in stock to be manufactured ...	...	11,000
Medium bright ditto ditto	...	1,500
Leaf manufactured into black Cavendish and medium bright smoking tobacco in stock	...	5,700
		58,711

8. The history of the next season, 1877-78, at Gházipur is the record of a series of troubles. I have indicated what I may really term the difficulty of keeping the curer alive. It was even more difficult to keep the plant alive, Gházipur having suffered perhaps more then any part of the North-Western Provinces from the severity of the calamitous drought, while, again, my predictions as to frost were confirmed by severe cold in January. Sixty acres were, however, kept going, and the outturn in cured leaf will be about the same as in 1876 (from 50,000 to 60,000lbs.); but the firm report "that the quality of leaf is not so good, owing to the almost entire failure of the rains." About three-fourths of the crop have been cured on the American system, and one-fourth in the ordinary native way, and is now stored in the houses on the farm. Whether it will be manufactured or sent home as cured leaf depends on the circumstances to which I refer below in my 11th and 12th paragraphs.

9. Luckily Pusa lay beyond the circle of severe drought, and the new curer was able to bring 200 acres under cultivation. He found cultivators accustomed to rear the plant, and not, as in the North-Western Provinces, new to the work, and had far fewer difficulties to overcome than Mr. Williamson had to face at Gházipur. The crop has been in the last month or two cut and cured, and the firm report, on the authority of the curers, that the leaf will compare favourable with a good deal of the low grade American tobacco that sells in England at from 4*d.* to 8*d.* per lb. The outturn of cured leaf is estimated at 150,000 to 175,000lbs, of which the firm propose to ship about 100,000 to England in the leaf state, and to manufacture the balance next year.

10. In answer to a reference made by me to Messrs. Begg, Sutherland, I have obtained the following opinions by the two curers, on the prospects of the industry.

"Mr. Williamson is of opinion that the tobacco grown here (Gházipur) in the seasons of 1876 and 1877 would fetch about 4*d.* per lb. in the English market, but that with fairly good seasons he will be able to produce leaf that will sell for a much higher price. He considers that the lot of tobacco that was cut in December, 1876, before the hail came, would bring 7*d.* per lb. in England, in spite of the general prejudice that exists against Indian tobacco; and he feels confident that, with an average Indian season, he will be able to produce a class of tobacco that will meet all the requirements of the English market. As regards manufacturing, he is of opinion that if the enterprise is properly backed up by all the parties interested in it, that there is a great future for the trade. He has already manufactured some black Cavendish, which he considers in every respect as good as the bulk of black Cavendish exported from America; and if American manufacturers could see it, they would feel that they had formidable rivals to contend with in India."

"Mr. Cabaniss has hardly been long enough in the country to enable him to form an opinion as to what can be done in tobacco at Pusa; and as he has not yet completed the curing of the crops he cannot make an estimate of its market value: he, however, considers that the bulk of the crop now being cured will suit the English market, and that it will sell for a much better price than any Indian tobacco has sold for in England. He further adds that, from what little he has seen of the climate at Pusa, he thinks that the place is very suitable for tobacco cultivation, on the American system, and that he will be able in course of time to produce tobacco that will compare favourably with the Virginia leaf. The manufacturing machinery for Pusa has not yet been got out from America, and Mr. Cabaniss has not made any experiments in manufacture, but he is of opinion that he could make good black Cavendish from the crop now being cured."

11. I have referred in some of the preceding paragraphs to "manufacture." When my last report was submitted, proceedings had not reached this stage, and it was not then known whether, as in the case of Java and other tobacco-producing countries,

it would not be advisable to restrict operations to the export of cured leaf for manufacture in England. At the same time the firm decided to make, on a small scale, experiments ("not in cheroot making, which is not a speciality of the Virginian trade," but in the manufacture of cake tobacco, such as golden leaf, Cavendish, &c., for which there might be at any rate some demand in this country, if not abroad). Messrs. Begg, Sutherland accordingly imported some hand-press machinery from America, and fitted up a small factory at Gházipur, and, beginning to manufacture in December last, have now turned out some 3,000 or 4,000 lbs. of black Cavendish, which is certainly as good as, and in my opinion better than, a great deal of the same class of tobacco used by troops. Samples will shortly be circulated to regiments.

12. If this part of the enterprise is successful, and a market is obtained for manufactured tobacco in Europe and the colonies, profits will undoubtedly be so large as to induce a great extension of the industry. As in the case of tea, Indian manufacturers, beating other competition in the labour market, will find their best security in freedom from adulteration, and will be induced, for their own advantage, to supply a pure, wholesome article, which (if the leaf, properly cured and manufactured, is found palatable) must gain favour among smokers, and it may be hoped that the almost unlimited markets of Europe and the colonies will eventually accept the tobacco made in this country.

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14. Government, I need hardly say, both in India and at home, can greatly assist in establishing a market by introducing the tobacco to the favourable notice of army and navy authorities, upon whom the fact should be impressed that the very cheap tobaccos obtained on contract from America are the poorest portions—the dross, as it were, of the crop of that country; whereas the still cheaper tobacco which can now be given from India is carefully selected as the best of the outturn. A certain amount of prejudice has doubtless to be overcome, for British soldiers and sailors are conservative in their tastes, and I therefore recommend that some means may be taken to secure at starting an unbiassed and unprejudiced opinion on the merits of the tobacco and deprecate any attempt to force it upon smokers, military or naval.

15. I despatched on the 6th April, 1878, a case of tobacco manufactured at Gházipur, to be forwarded to Her Majesty's Secretary of State for India, and containing the following samples:—

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17. I have now to refer to my supplementary project of attempting the introuction of tobacco cultivation in Kumaun. In accordance with Government Order No. 2133A, of 1876, dated 7th December), I placed myself in communication with e Commissioner of Kumaun, who selected land near Almora early in 1877, and I ecided, pending the clearing of the land, to make an experimental trial of tobacco in ree or four acres at Ránikhet, under the supervision of Mr. Troup, planter of that lace, who appeared to take an interest in tobacco cultivation. Meanwhile, I requested Mr. Williamson, the Gházipur curer, to write about a Mulatto.

18. No part of the scheme succeeded. Later in the year the Commissioner of Kumaun reported that the selected land was found to contain insufficient good soil. The drought seriously injured the tobacco, and the answer from America was unfavourable to the importation of a Mulatto.

19. When it became necessary on account of his health to send Mr. Williamson to the Himalayas in October (the curing season of the hills), I requested him to cure Mr. Troup's crop. The plant, however, had suffered so much that the experiment was not satisfactory. Added to which the Gházipur firm telegraphed that rain having unexpectedly fallen, it was at last possible to cure the leaf at Gházipur, which had been for several months left hanging in the curing-house in the vain expectation of moist weather. I was obliged, therefore, to send back the curer to Gházipur as soon as he was well enough, and Ránikhet operations were interrupted. This is another, though small, instance of the disturbing influence of the drought of 1877.

20. For the present year I have obtained the permission of the forest authorities to grow, under the supervision of the superintendent of the Ránikhet forest nursery (Mr. Craw), four acres of tobacco. The Commissioner of Kumaun has selected other land for future trials, which he wishes me to inspect this year, and Messrs. Begg, Sutherland have promised to spare the services of one of their curers to cure the Ranikhet crop in October, which, as a cheap curer cannot be procured from America, is the best plan to pursue for the present.

21. I may add that the Commissioner of Kumaun is anxious that the land chosen should be utilised for the establishment of fruit orchards and other useful purposes, and that preparations have been made to grow stock to furnish the estate as soon as the land is chosen. Any expense, therefore, that will be incurred on tobacco will be shared and probably recouped by other operations which have for their object the increase of the food supply of the country. I agree with the Commissioner in believing that it will be possible, and, if so, very desirable, to effect on a large scale the exportation of apples, which have now been proved to succeed so well in the Himalayas, to the plains.

22. During the time that the curer, Mr. Williamson, has been in the country, I have lost no opportunity of obtaining from him detailed information on the subject of tobacco curing, which I have of course also seen in operation at Gházipur. I have collected the information so obtained in a pamphlet, of which a revised edition has lately been published, and of which I append ten copies. The pamphlet has been freely supplied to planters and any others who have asked for it, and a certain amount of information on the subject has thus been distributed over the country.

23. Planters throughout the north of India are watching the results of Messrs. Begg, Sutherland's enterprise with great interest, and as soon as they are satisfied that success is obtainable, will, I am assured, in many cases follow their lead. I am very much inclined to doubt, however, whether great success will be obtained by any imitators unless their action in importing skilled curers from America is copied. Tobacco curing cannot be taught only by book any more than any other trade requiring skill in manipulation and practical experience.

I have the honour to be,

SIR,

Your most obedient servant,

E. C. BUCK,

Dir. Dept. of Agri. and Com., N.-W. P. and Oudh.

(COPY.)

No. $\frac{634 \text{ A.}}{\text{XXII-25}}$ OF 1876.

FROM

THE DIRECTOR OF AGRICULTURE AND COMMERCE,
NORTH-WESTERN PROVINCES,

TO

THE SECRETARY TO GOVERNMENT,
NORTH-WESTERN PROVINCES.

Dated Allahabad, the 10th November, 1876.

SIR,

IN continuation of my note on tobacco cultivation at Gházipur and in the North-Western Provinces (No. 806A., dated 18th October,) I have the honour to make the following supplementary report.

2. When I received charge of this department, His Honor Sir John Strachey desired me to make all possible enquiries regarding the practicability of growing, curing, and manufacturing tobacco in these provinces for European consumption, and to propose any plans which might appear to be feasible for the furtherance of this object.

3. The Gházipur experiment was the first result of the instructions which I received. I promised, however, when I set on foot operations at Gházipur to extend my enquiries to other parts of the North-Western Provinces.

4. The only tracts in the provinces which appeared to me to be free from the objections of the extreme dryness and frost of the North-Western plains were the Sub-Himalayan Tarái, including the Dún and the Himalayan region proper.

5. I have not yet had the opportunity of fully ascertaining what are the conditions in the Dún and Tarái, but I have made careful enquiries at Kumaun.

6. In the first place it must be explained that the season in the hills differs entirely from the season in the plains. In the former (the hills) tobacco is sown in March and cut in October, and in the latter (the plains) is sown in October and cut in March. The hill season is therefore free from frost.

7. A year and a half ago I sent some Virginian tobacco-seed to Mr. Troup of Ranikhet and to Mr. Craw of Dunagherie, who had both kindly volunteered to try experiments for me. Mr. Troup sowed the seed at Ranikhet, but was prevented by severe illness from prosecuting any curing experiments. The tobacco, however, grew up and sustained the climate so well that it disseminated itself over jungle land in the proximity, where healthy plants are now growing in a wild state. Mr. Craw both grew the plants and cured the leaf, which proved to turn out a tobacco of good quality.

8. In October last, I obtained the permission of Messrs. Begg, Sutherland to bring to Kumaun Mr. Williamson of Virginia, who is in their employ as curer at Gházipur, and whose health had there suffered. He accompanied me to Ranikhet and visited Dunagherie.

9. He gives a decided opinion on the following points: The climate is better than that of the plains for growing and curing a fine-flavoured tobacco, and is in many respects like that of Virginia. The plants grown by natives as well as those on Mr. Troup's estate are of very promising quality, and the fact of the plant growing wild indicates the suitability of the climate. The tobacco cured by Mr. Craw is of good quality and of fine flavour, though it has lost much strength by hanging too long. The night weather of October and November, after the rains have cleared off, is perfect for curing—exactly the weather, in fact, which is most desired in Virginia during the curing

season. Forest soil with good vegetable mould is the best that can be had for tobacco, and is superior to land manured chiefly with organic matter. Mr. Williamson believes that land suited for tea will be found suited for tobacco. He strongly advises attempting tobacco culture in the hills if sufficient land can be found for the purpose.

10. Mr. Williamson himself is unable to leave Ghâzipur, where he is prosecuting Messrs. Begg, Sutherland's enterprise under a three years' contract. He informs me, however, that through his relations and friends in America, who are all connected in some way with tobacco interests, he will have no difficulty in procuring a thoroughly trained Mulatto for a salary not exceeding £100 a year, who would be quite capable under European supervision of taking the position of overseer on a tobacco estate just as a Chinaman does on a tea estate.

11. I may here notice that the principal difficulty hitherto encountered in promoting tobacco enterprise in this country has been that of procuring the services of skilled curers and manufacturers. Many a planter and resident of India has appreciated the vast capabilities of tobacco as a remunerative article of commerce, but no one has known how to bring it to the European market in a proper condition. What success Messrs. Parrot and Skinner had in Bijnor was attributed by the settlement officer to their "having caught a Cuban sailor." No thoroughly experienced tobacco curer, however, has hitherto been brought to the country until the arrival of Mr. Williamson, and I am strongly of opinion that such opportunities as now offer themselves ought not to be lost of increasing the number of men skilled in the trade until a sufficient supply has been introduced into the country for the instruction of our planters and cultivators. When once the requisite knowledge and skill has been acquired in India, the industry will carry itself on in the same way as has the cultivation and preparation of tea.

12. In a conversation which His Honor Sir George Couper was pleased to permit me to hold with him on the subject, His Honor suggested that if Government brought out a curer with whose services it might be found afterwards desirable to dispense an indigo planter might take him into his service. I feel almost sure that there would be no difficulty in so disposing of him, because, as I have stated in my previous note, indigo planters are, in the face of the decline of indigo, only too anxious to take up a new industry of so promising a character as tobacco.

13. We have during the past year and a half done all that can be done of a preliminary character. The plant has been grown and cured and found to succeed to a sufficient degree to justify further steps, and the only step which it is now possible to take is to procure a skilled curer and manufacturer.

14. The proposition which I place before Government is this—

(1),—That Mr. Williamson be asked to procure a Mulatto curer;
(2),—That suitable land be chosen in Kumaun;
(3),—That the experiment be placed under the charge of some responsible officer.

15. The reasons why a "Mulatto" is named are that, on the one hand, an American is much more expensive than a Mulatto, and on the other that negroes are unwilling to leave the place in which they have been brought up. It is necessary to accept Mr. Williamson's assertion that a thoroughly trained Mulatto can be procured. He should receive immediate authority for one, as the curer would be required as soon as possible after March, when the seed will be put in the ground.

16. I am unable to give any definite suggestions as to the locality in which the experiment should be tried. The area ought not to be less, and may be much more, than 200 acres, and should be of the same class as land chosen for tea. The most suitable elevation would, I believe, be from 4,000 to 6,000 feet, as in both Dunagherie and Ranikhet the plant grew well. Irrigation is an advantage, but not indispensable,

as the chief growth is made by the plant in the rains. Some land is said to be available near Lobar, and from what I hear of it, it is not improbable that it could be found suitable.

17. The choice of the officer under whom the experiment should be placed would depend somewhat on the locality chosen. Mr. Tengelly, Forest Officer of Ranikhet, and Mr. Craw, of Dunagheri, have been mentioned to me, but I doubt if the latter gentleman's services would be available.

18. On the questions named in paras. 16 and 17, the advice of the Commissioner of Kumaun will be requisite. I presume, indeed, that the Commissioner will be consulted upon the whole proposition brought forward, and that any steps which may be taken, will be taken only with his concurrence.

19. I ought to have brought to notice the fact that tobacco cannot be grown consecutively on the same land each year, and that (as I have explained indeed in my former note) it is never the sole, though it may be the chief, product of a so-called tobacco farm in America. I am told, however, by Mr. Williamson that it is often grown between rows of orchard trees, which are improved by the loosening of the soil. In considering what should be the alternative cultivation in Kumaun, I have come to the conclusion that the safest measure to take would be to plant rows of tea bushes at double the ordinary interval, and cultivate tobacco in alternate intervening spaces in alternate years. The estate would then be growing in value as a tea plantation, and could be sold by Government as such on the completion of the experiment. If this course were adopted, the experiment might be economically conducted under the management of some trustworthy person skilled in the work of a tea plantation. I have no doubt that such a person could be found. I wish to make it plain that, while it would be waste of time and money to grow tobacco *alone*, it would be useless for a European to attempt the cultivation of ordinary native crops, and that the only alternative is tea. Moreover, tea curing and tobacco curing being carried on in the hot and cold weather respectively, the hands employed in the one can be retained for the other.

20. I took the opportunity when in Ranikhet of visiting the canteen of one of the European regiments at that station for the purpose of examining the tobacco supplied to the men. The canteen sergeant informed me that it was not liked, and indeed that it was not smoked except by the older hands, the young ones preferring to spend five or six annas a day in cigars, as the tobacco supplied was too strong and rank. I showed a specimen to Mr. Williamson, who at once recognized it as a class of tobacco "put up and doctored for chewing and not for smoking," and not only that, but "as belonging to the worst class of chewing tobacco, such as is used by negroes and whites of the lower classes." Its cost to the soldier is 14 or 15 annas a pound. It seems to me impossible not to believe that smoking such tobacco is injurious to the health, and that if, as I believe probable, a really good and wholesome native-grown tobacco can be supplied to the troops at about a rupee a pound, it will be advantageous to Government, as a matter of military economy, to procure it in India. I am able to assure Government that on the evidence of two or three smokers the tobacco roughly manufactured at Ghâzipur is of good and pleasant flavour, and has indeed been regularly smoked for weeks by one or two gentlemen residing in Ghâzipur; if Mr. Williamson's prognostications are true that a better tobacco can be manufactured in the hills, it will certainly be of a class that will approve itself to the British soldier.

21. This leads to the question of manufacture. Mr. Williamson states that if manufacturing is confined to a single class of cake (such, for instance, as is found to suit the soldier's taste) it will be quite practicable to manufacture with hand-presses and appliances such as could be constructed in an ordinary carpenter's shop, and that it will not be necessary (at any rate unless the plant is grown on a very large scale) to set up any extensive machinery. I have asked Mr. Williamson whether a curer can be obtained who understands manufacturing as well as curing, but, though I have not received his answer, I am doubtful whether it will be possible to do so. Mr. Wil-

liamson himself understands both processes; but he has informed me that he is an exception, and I am aware that considerable trouble was taken in America to find for Messrs. Begg, Sutherland a manager who was equally well acquainted with all branches of the trade. But a great deal of information can be supplied by Mr. Williamson, who may also, with Messrs. Begg, Sutherland's permission, be allowed to make experiments in manufacturing the leaf cured in the hills. If the result is successful, it will be worth while either to have a man educated by Mr. Williamson or to procure another Mulatto from America.

22. I request the favour of an early reply, so that, if the experiment is to be tried at all, another year may not be lost.

I have, &c.,

E. BUCK,
Director of Agriculture and Commerce,
N.-W. Provinces.

Rec'd 2/6/76

Rec'd A—2nd Aug't/76

No. $\frac{\text{606A.}}{\text{XXII.—25.}}$ OF 1876.

FROM

THE DIRECTOR OF AGRICULTURE AND COMMERCE,
North-Western Provinces,

To

THE SECRETARY TO GOVERNMENT, N.-W. PROVINCES.

DATED ALLAHABAD, THE 18TH OCTOBER, 1876.

SIR,

I HAVE the honour to submit the following report upon the present position and prospects of the tobacco experiment at Ghâzipur, on which I have now had sufficient opportunity to form an opinion, and although the data from which it is derived are confessedly imperfect, yet sufficient experience has been gained to enable me to indicate in what direction to suggest further steps. I write this letter at the conclusion of a month's residence at Ghâzipur, during which time I have been in constant communication with the Virginian curer.

CIRCUMSTANCES UNDER WHICH FARM WAS ESTABLISHED.

2. About a year and a half ago, the Government of India removed the stud from Ghâzipur, and directed the Government of the North-Western Provinces to utilize any portion of the land which might be required as a model-farm. About the same time the North-Western Government desired me (as being in charge of the local Agricultural Department) to direct my attention to the development of tobacco cultivation and trade.

3. Shortly after this occurred, Mr. Cooper, the Cawnpore member of the Calcutta firm of Messrs. Begg, Sutherland, & Co., intimated to me that their firm was anxious to institute an enterprise in tobacco, and this led to a proposal being made by me to offer the stud lands and buildings on favourable terms to Messrs. Begg, Sutherland, & Co. on such conditions as would guarantee their *bonâ fide* continuance of the undertaking. This course was approved by Government.

4. Briefly, the terms which have been made are these: about 1,200 acres have been rented to the firm at about half the rental of Rs. 10,000 or Rs. 11,000, which was being paid direct to Government by the cultivators, *i. e.*, they have been assessed at the ordinary 50 per cent. revenue of the temporarily settled districts: the concession may be roughly estimated at Rs. 5,000, in addition to which a rent-free occupation of certain of the stud buildings and bungalows has been allowed. The concession is granted for five years.

5. On their part, Messrs. Begg, Sutherland, & Co. have brought over a curer from Virginia to whom they pay £300 a year, and they are responsible for all expenditure on cultivation, curing apparatus, and machinery, for all loss on tobacco operations, and for all repairs to buildings occupied by them. They have also agreed to allow the Ghâzipur operations to be open to inspection. The curer is engaged for three years.

6. The reasons which led to the selection of Ghâzipur as the best place in which to commence an enterprise were the following:—

(1.) The fact that the land was in the possession of Government.

(2.) The presence of buildings which might be utilized for curing operations and other purposes.

(3.) The proximity of the land to a town from which manure might be obtained.

(4.) The presence of a large population of Koeris, who are the best class of cultivators for such a plant as tobacco, and who may be described as the market gardening class.

(5.) The proximity of the opium factory, which affords another manure supply, and has accustomed the agricultural population to work for Government.

(6.) The necessity of bringing a foreigner for the first year or two into a civilized and accessible place.

(7.) The desirability of being below the frost line.

CLAIMS OF EX-PROPRIETORS TO STUD LANDS.

7. The completion of arrangements with Messrs. Begg, Sutherland, & Co. was hampered by a claim raised by one of the former proprietors of the stud lands to the restoration of the proprietary right to himself. It was well understood that the same claim would be set up by all the ex-proprietors if this was successful. Pending the decision of the Civil Courts in the case, Government, who had induced Messrs. Begg, Sutherland, & Co. to bring out a curer, guaranteed to secure to them at least 500 acres if necessary by purchase.

8. The case has been decided in the Court of the Judge of Gházipur in favour of Government, and although an appeal may be made, I do not think that the former proprietors have any chance of a decision in their favour, as the records in the Government offices prove that the land was taken up permanently, or for such time as Government might require the land, without any reference to the special requirements of the stud.

AGRICULTURAL OPERATIONS ON FARM.

9. The stud lands had hitherto either been uncultivated or only planted with crops of inferior description. Very few cultivators resided on it, and it had a bare and neglected look, although possessing natural soil of quality very well suited for working up with manure into first class garden soil. I determined to settle Koeris upon it, to divide it into well-defined blocks, and to collect manure. Land is prepared for tobacco in the rains, sown in August or September, and planted out in September or October, and gathered in during January and February. Last year no operations could be undertaken till April, when the old leases expired; and then the first step was, as I have stated, to build huts and plant villages over the land for the new Koeris. I left India on leave in May, and at that time it was not known when a curer would come out, or if, indeed, he would come at all. I left directions to continue the establishment of villages, the division of the land into blocks, and the collection of manure, all of which the Collector, Mr. Oldham, kindly arranged. I provided also for the planting of a few acres of tobacco, the management of which Mr. Cooper (the Cawnpore partner) undertook as far as the distance would allow him, and I appointed a Eurasian (who had worked for some years an indigo factory) to carry out his orders. At the same time I directed the superintendents of the Government farms at Allahabad and Cawnpore each to cultivate three or four acres.

10. When I returned in November I found that the Gházipur tobacco had been put in late, and was very poor. It had been cultivated unskilfully, and was not good in appearance. The manager under Mr. Cooper was perhaps not so efficient as he was represented to be, but the fact must be fully appreciated that the farm was a great deal too young for the cultivation of tobacco, which requires either rich forest land or a carefully worked up and mellowed soil. The Allahabad tobacco was very fine in appearance and well grown. The Cawnpore plant was smaller, and not very well cultivated, but better than that in the Gházipur fields.

11. Here let me describe the conditions under which tobacco was grown at each place, and point out the deductions which may be drawn from the results.

In Gházipur most of the land had never been well tilled, and had, with the exception of a small area, never received manure until last year. It was also exposed to wind and drought. The tobacco was cultivated without skilled superintendence, and imperfectly irrigated. In Allahabad the land was richly fed with nitrogenous manure, and had been cultivated as a market garden for some few years. The plant was carefully tended and irrigated. It was, however, exposed to a wind which broke and dragged the leaves on the ground. In Cawnpore the soil was garden soil, but not so richly manured as at Allahabad, and the situation was more sheltered. The Gházipur plant gave a poor out-turn and was much broken and trailed on the ground by the hot winds, but was in many cases better flavoured and more fit for working up into a good class tobacco than that at Allahabad, which was coarse and rank, although to an inexperienced eye it looked magnificent on the field. The Cawnpore plant gave a better out-turn of leaf and a larger percentage of tobacco fit for curing than either.

12. The conclusion is that soil requires to be worked up to the condition of garden mould, to be manured with vegetable and other light manures, rather than with the strong nitrogenous manures which natives generally use for tobacco.

13. The system adopted on the Gházipur farm will in the course of a year or two convert much of the area into garden land. The market gardening class of cultivators have been selected and distributed into small hamlets over the farm. Each man has four acres and keeps a pair or two of bullocks in his hut close to the ground, and they are themselves with their whole families, brothers, wives, and children, always at work in the fields. Already the appearance of the soil is changing. Any one, however, who knows anything about farming, or even gardening, must be aware that a proper condition of soil cannot be obtained in one or even two or three years.

14. Next year spring green crops will be sown on some at least of the land selected for tobacco in the following year. Meanwhile opium "trash," or broken leaves from the opium factory, ashes and bones from the city, and lime from the town kilns are collected to supplement and be mixed with the nitrogenous manure of the farm.

15. Irrigation is the chief difficulty at Gházipur. Water is deep, 60 feet or more from the surface, and both the construction of wells and the lifting of water are expensive. There is, however, a large rice tract on the north, the water from which is being concentrated in tanks, which will go very far towards supplementing well-irrigation. The natural drainage of two or three square miles which has hitherto escaped to the Ganges, swamping a large area in its course, will thus be diverted and stored for the use of the farm.

16. The farm is now fast growing into a condition of fertility, and has a very different appearance from that which it had a year ago, and in another year or two's time a great part of the land of central block of 500 acres will have been converted into soil of good quality for the production of tobacco. So far the progress being made is exactly what I intended and anticipated.

17. The seasons have been unfortunate. Last Christmas there was no winter rain, and the tobacco had to contend with excessive dryness. This year there has been an exceptional drought, so serious that I have thought of suggesting the advisability of abandoning the planting of tobacco for this season and of allowing the curer meanwhile to examine native tobacco cultivation and curing in other parts of India, rather than to risk a heavy loss and unsatisfactory results. But such a course will only be adopted if (at all) in case of the continuance of the drought. Messrs. Begg, Sutherland, & Co. are extremely anxious, I believe, not to accept the suggestion in any case, although I am sure that the course I propose will be the least disappointing in the end, if the drought becomes as serious as it threatens to be. The effect of a dry season on

tobacco is well exemplified by the following extract from a Virginian paper which describes the failure in America of the present season's crop :—

"Tobacco presents the very poorest prospect ever witnessed by the oldest planters. The frost, bugs, cut worms and horn worms, and the failure of planting seasons have cut down the crop with us to barely one-third of the usual average. The plants are still dying during the dry hot weather, while those that are living are making but slow growth. The season for the growth and maturity of the weed is about half gone. Plant-beds generally are burnt up, and it is now too late to plant, if plants were plentiful, although the indications point to about one-third of the usual average for this staple. The same substantially applies to our adjoining counties, the largest tobacco-producing district in Virginia and North Carolina. The tobacco traders, and most of the journals in their interest, profess to believe in the production this year of 'two-thirds of a crop.' Unless the prospect is greatly better in other portions of the State than in Halifax, the production of half a crop is an utter impossibility."

ARRIVAL OF THE CURER.

18. The curer came out in January,—Mr. Williamson of Pittsburg, Virginia; and I must express my conviction that Messrs. Begg, Sutherland, & Co. have performed most completely their promise to secure the services of a competent curer. Mr. Campbell, the member of a well-known tobacco exporting firm called Campbell & Co., and which is perhaps the most widely known American firm in the trade, undertook on behalf of Messrs. Begg, Sutherland, & Co., who appear to have had some acquaintance with his firm, to select with care a thoroughly experienced and steady man. This I am assured that he did, and certainly nothing could have been more satisfactory than Mr. Williamson's conduct and earnest endeavours for the success of the undertaking. He has, however, suffered slightly in health.

19. Mr. Williamson set to work at curing the Gházipur tobacco in March, April, and May, during which months I visited Gházipur several times. A great deal of the tobacco was very poor, and the curer complained of the way in which the leaves had been broken, and "dirtied" by being trailed on the ground by the dry west wind. Some of the Allahabad tobacco leaves were brought down by train to Gházipur, but were found very rank and coarse. Once during May, and afterwards in June, the curer went to Cawnpore and cured the tobacco at Cawnpore. It was, as I have before stated, in better order, and a much larger percentage of leaf was good.

TOBACCO CURING AND RESULTS OF GHAZIPUR OPERATIONS.

20. It has from the first been intended to ascertain at Gházipur what can be effected—(1) in producing well cured tobacco leaf for the use of manufacturers of smoking tobacco, (2) in manufacturing tobacco for smoking.

21. The second object was believed to require much more capital, special knowledge, and appliances than the first, and it was determined to make the first experiment complete before attacking the second.

22. I will endeavour to place before Government all the facts which I have myself acquired about tobacco curing and manufacturing, and the arguments which it appears to me may be fairly based upon them. Data are at present very imperfect, and the experience which has been gained in this country very small. It is not improbable therefore that many of the ideas which I have formed, and of the estimates which I shall give below, will require considerable modification. Before proceeding to figures, however, I must explain that in every estimate I have assumed figures unfavourable to profits, *i. e.*, that cost can hardly be higher or income less than I have estimated them to be.

TOBACCO CURING.

23. The curing of tobacco (whether for sale in a foreign market or for conversion into manufactured tobacco in India) has first to be considered. I have been surprised

to find that 100 acres is considered to be a large area for the supply of a single curing house in America. A single curing establishment in Virginia seldom undertakes more. When I visited the colonies last year I became acquainted with Mr. William Cameron, a leading member of the firm who sent out Mr. Williamson, and who has lately established a large factory at Sidney, where cured leaf exported from Virginia is manufactured. This gentleman informed me that curing houses are in Virginia generally managed by the planters who grow tobacco, and that 160 acres was considered a very large area for one tobacco farmer to cultivate and cure annually. Mr. Williamson confirms the statement made by Mr. Cameron.

24. The following is an attempt to estimate the conditions of cultivating 100 acres annually :—

25. The average out-turn of dry tobacco leaf on good land, with careful cultivation, may, I believe, be safely estimated at 800lbs. per acre. The cost at which 800lbs. of fairly good tobacco may be bought from the cultivators can, I feel sure, be kept within a maximum price of Rs. 80 per 800lbs. The curer is of opinion that tobacco leaf here can be cured so as to sell for an average price of 5*d.* a lb. (untaxed) in the English market, and considers this a safe estimate, and expects to increase the average to 6*d.* or 7*d.* The price of 800lbs. at 5*d.* a lb. is £16-13-4. There is therefore the difference between £16-13-4 and Rs. 80 or (without calculating exchange) £8 on which to cure, send home, and obtain profits on 800lbs. of tobacco, which is equivalent to £1-1-8 per 100lbs.

26. The difficult point to ascertain is the actual cost of curing, and I wish here to point out distinctly that the chief use of the Gházipur experiment will be to discover it. The Government of the North-Western Provinces have placed Messrs. Begg, Sutherland, & Co. in such a position that they can solve the problem at a comparatively small cost to themselves, and I have spared no pains to impress upon them that they must not hope to go any further during the first year or two of the enterprise. While I am bringing the farm into a proper condition for the cultivation of tobacco, and while Mr. Williamson is learning the conditions of the climate and the character of the people with whom he has to deal, the problem is gradually being solved. Messrs. Begg, Sutherland, & Co. were at first intent upon immediately undertaking extensive cultivation in the hope of large profits; but I pointed out that to cultivate unprepared land and to throw an enormous quantity of labour upon their curer, bewildered as he must be with the new conditions with which he is surrounded, could only have one result, which would certainly not be in the direction of large profits. I am glad to say that the firm is coming round to the same opinion.

27. Mr. Williamson came out too late this year to direct in any way the cultivation of tobacco, but he was in time to gain a great deal of experience as to the conditions of the climate during the curing season. The season was, in consequence of the absence of winter rains, unusually dry, and the curer was able to decide that steam would be a necessary adjunct to the curing house, and a very rude steam apparatus was attached to one of the stud buildings, which was so built up as to prevent the escape of steam. I may mention that steam is used in America in the manufacturing, but not (in Virginia at any rate) in the curing house.

28. The curer advises getting in the crop for curing as early as possible, so as to avoid the chance of dry west winds, which tear the plants in the fields and make the leaves difficult to handle in the curing house, and considers also that it should be ascertained whether it will not be better to leave tobacco to be handled in the rains. In this case it will be necessary to use fuel to dry instead of to moisten the air of the curing rooms whenever necessary. The curer kept some of his leaf on purpose to try the experiment, and believes that it is better to do so, as the leaf is more manageable when the atmosphere is damp. I do not feel sure that he is right, simply for the reason that we have this year almost a drought, and that consequently the curer does not know how damp an Indian rainy season can be.

29. The uncertainty which still exists as to the final method which will be adopted and the incompleteness of the arrangements this year, due to the curer not being acquainted with the requirements of the climate, as well as to the fact that no proper curing houses of apparatus could possibly be prepared in time, quite prevent my being able yet to give any safe indication from Gházipur experience of what curing expenditure will be, nor can I draw any inferences from expenditure in America, where the cost of curing is involved in the expenses of the farms. I can only state what the margin for curing is likely to be on the assumption of the statistics given in para. 25.

30. I estimated a margin of £1-1-8 for curing, export, and profits on 100lbs. and an out-turn on 100 acres of 80,000lbs; the margin on 100 acres is therefore £1-1-8×800=£867-4-0—

	£	s.
Curer's salary is	300	0
Cost of export (say)	300	0
Left for curing	267	4

or less than 1*d.* a lb.

31. The margin left for curing can be enlarged in five ways:—

(1.) By the increase of out-turn over 800lbs. per acre.
(2.) By the increase of area over 100 acres.
(3.) By the reduction of cost below Rs. 80 for 800lbs.
(4.) By the improvement of curing to a class which will fetch on the average more than 5*d.* a lb.
(5.) By the removal or reduction of curer's salary.

32. I am hopeful that a great improvement may be made under head (3), and as the curer has succeeded in curing some very good specimens of what is technically called bright (or golden) leaf, which is valued at a high price (1*s.* to 2*s.* a lb) in the tobacco market as "wrapping leaf," *i. e.*, as leaf in which inferior tobacco is wrapped, and of which class he will probably be able to produce a large percentage as time goes on, it is evident that there is also room for extension of profit under head (4).

33. A penny in the lb. decrease in the cost of leaf, or a penny in the lb. increase in the average price of cured leaf, gives an increase to the profit on 100 acres of over £300. On the assumption therefore that 5*d.* a lb. will pay expenses, 6*d.* a lb. will give £300 profit, 7*d.* a lb. £600 profit, and so on.

34. Although the higher priced tobaccos require a much more expensive method of preparation, yet it is probable that the average price of tobacco may be raised to 6*d.* or even 7*d.* without any corresponding increase in cost of cultivation or curing. The price adjudged in England and Australia will be some guide to an estimate on this point. Samples of cured leaf were sent home this year to England, and I am now sending samples to the Sidney factory. Although the leaf is inferior to what can be produced in future years, in consequence of the curer only having arrived at the end of the year, without any means and appliances ready for him, still the opinion which is given of it by disinterested judges will be of some value. The most serious item of expenditure is the curer's salary. If this item is removed curing must pay, and I cannot but believe that indigo planters and others will be able to gain sufficient knowledge and experience to be able to turn out tobacco of a good marketable quality.

MANUFACTURE OF TOBACCO.

35. I cannot give much detailed information about the method followed in manufacturing tobacco in America, nor is it at present necessary. If skilled experience is requisite for the proper curing of tobacco, much more so is it in the manufacture of it, as the production of the article in a marketable form depends to a great extent upon a practical acquaintance with trade secrets, as well as upon a knowledge of the qualities of the tobacco leaf brought to the factory. It may be taken for granted

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that if a factory is established it must be conducted by a person or persons skilled in the business.

36. The following facts are, however, of general importance. A first-class factory in America will, I am informed, turn out 10,000lbs. of the manufactured article daily. Foreign matter is mixed with the leaf in manufacturing, but, on the other hand, the stem is rejected; and, on the whole, a given weight of cured leaf, including stem, will supply a greater weight of manufactured tobacco, including foreign matter. The excess will not, I am informed, exceed 10 per cent. Supposing, then, that 9,000lbs. of cured tobacco are required to feed a first-class factory daily, the quantity required to supply the annual out-turn is 365×9,000, or 3,285,000lbs. This, at 800lbs. an acre, involves the cultivation of 4,106 acres. If we may assume that tobacco ought not to be grown more than once in three years on the same land, the extent of land required to feed a first-class factory would be about 12,000 acres. A small factory is about one-fourth of the above size, and would require an area of 3,000 acres to feed it.

37. Formerly a great deal of hand machinery was used in America, but the increase in cost of manual labour has resulted in the substitution of much steam and hydraulic machinery. A great deal of manipulating work is, however, still done by hand, as I myself had the opportunity of observing in the Sidney factory, where machinery is utilized to the fullest extent.

38. It appears to be the invariable practice in the manufacture of tobacco cakes or twists to have the covering leaves or "wrappers" of much better quality than the inside leaves or "fillers." The leaves most valued for wrapping the higher classes of tobacco are of a fine texture and of a bright golden colour. They fetch 1*s.* to 2*s.* a lb. The fillers vary greatly in price, according to the quality of the tobacco. The weight of wrappers to fillers is, in ordinary tobacco cakes, about 1 to 4.

39. The cost of manufacture in America is estimated about 5*d.* a lb., inclusive of interest on capital, but exclusive of all kinds of taxation. The state of things in Virginia appears to be this: large profits, or rather profits upon an extensive scale, are not made by the tobacco farmer, but by the tobacco manufacturer. The tobacco grower and curer is ordinarily the farmer of an estate who makes money out of a variety of produce as well as out of tobacco. Tobacco may be his main crop, but if tobacco fails him in any season, he falls back upon something else, just as an indigo cultivator in Tirhoot pays his rent out of cereals when the rain swamps his indigo. Manufacture is the trade in which capital is invested with the object of securing steady and extensive profits.

40. No export tax of importance is levied on tobacco sent on board ship, but a heavy inland revenue duty is charged on manufactured tobacco retained in the country.

41. Although the curer has had no proper appliances to work with in Gházipur, yet he has succeeded in turning out tobacco cakes of very good appearance and of tolerably fair quality. The tobacco is pleasant to smoke, and has much more flavour than any Indian-made tobacco which I have ever tasted.

42. Flavouring substances and perfumes are extensively used in the preparation of tobacco, and I find that the greater number are procurable at a cheap rate in this country. The Tonquin bean is an exception.

43. I am informed that the cost of manufacture in America is (inclusive of interest on capital) about 5*d.* a lb.

Now suppose that selected native-cured leaf cost Rs. 8 a maund, or about 1·7 a lb., and cured wrappers 6 annas a lb., the weight of wrappers to fillers being 1 to 4, 5 lbs. would cost 6 annas + 6 annas 4 pie (= 4 × 1·7) = 12 annas 4 pie.

If manufacturing cost, say, Rs. 1-4 at 4 annas a lb. (which is more than 5*d.* a lb.), the cost of 5 lbs. would be Rs. 2-0-4, or about 6½ annas a lb. = 9¾*d.* a lb. Now I have not the least hesitation in saying that the Gházipur cakes of this year would fetch a very great deal more in India.

In the above estimate I have estimated cost highly, and have not included foreign matter, which on the average costs less than tobacco.

UTILIZATION OF NATIVE TOBACCO.

44. The question how far native-cured tobacco can be utilized requires further enquiry, which I hope will be made during the ensuing season. There is no possibility of establishing a system by which green leaf can be brought from any distance to a central curing house. The leaf must either be cured on the spot or taken to a curing house in the immediate vicinity.

45. The curer pronounces most of the native leaf which he has seen to be coarse, acrid, and in such a broken condition as to be unfit for European manufacture. His remarks refer especially to tobacco produced and cured in the North-Western Provinces. The best he has seen came from Tirhoot.

The curer doubts whether tobacco can be cured up to a good remunerative price, except by a person trained for years to test the condition of leaf by look, touch, and smell. And his belief is no doubt to a great extent correct. It is at the same time a fact that tobacco cured by a planter has been valued at home at a price above 5*d.* a lb.

46. Before any definite opinion is declared upon this point, which is very important, I recommend that a very thorough enquiry be made into the character of tobacco grown and cured in different parts of the North-Western Provinces and Bengal. It is well known that the curing process in East Bengal approaches much more nearly to the European and American method than that in the North-Western Provinces, while both the Tirhoot and East Bengal leaf (Púrabí) has a better reputation than any other Indian tobacco.

47. There appear to be very fair grounds to expect that the best native-cured leaves may be used as fillers for some classes, at any rate, of manufactured tobacco, and also that indigo and other planters may grow and cure, without American superintendence, a better leaf than any which now goes into the market.

48. The expense of raising tobacco in the North-Western Provinces is greater than that in Bengal on account of the necessity of irrigation, and the consequence is that very little tobacco is grown, except where wells are rich in nitrate manures and produce a heavy, large-leaved, and strong-flavoured crop. But in some parts of Tirhoot and East Bengal irrigation is very little needed, and cultivation is undoubtedly cheaper there.

49. I propose that I should, and as far as possible that the curer should, during the ensuing season make as thorough examination as we can of the conditions under which tobacco is grown and cured in the North-Western Provinces, Tirhoot, and East Bengal, and especially in the two latter tracts of country; and also that the merits of native-cured tobacco brought to market should receive a more complete investigation than they have during the past year.

CONCLUSIONS DRAWN FROM FOREGOING STATEMENT.

50. There appears to be every reason to believe, from the experience even of the broken year during which the curer has been in the country (about seven months), that a tobacco can be grown and cured which will compete successfully with American tobacco.

Cured leaf of such quality can be sent to Europe at what will certainly be a remunerative price if curing is done by cultivators or planters (and possibly also

even under skilled American supervision). Leaves of good bright gold colour and of the proper texture can be cured which will serve as wrappers, of a class which may be priced at 1*s.* a lb. The cost of cultivation and curing wrappers will be more than that of producing fillers, but the fact remains that good wrappers of the proper texture and quality can be turned out. This is important. Wrappers must be had at any price, even at a loss. Fillers will pay the profits.

One curing house cannot undertake the curing of all the tobacco required for a factory. This is evident from the fact that the area which feeds a curing house must not greatly exceed 100 acres annually under tobacco, or 300 acres of good tobacco land (tobacco being grown once in three years), while a factory requires from 4,000 to 12,000 acres.

51. The profits to be made on curing are not likely to be great enough to induce capitalists to set up curing houses under American skilled supervision simply for the sake of sending cured tobacco to England or to a manufactory.

52. A capitalist who wishes to follow Messrs. Begg, Sutherland, and Co.'s example must in the first instance purchase at least 300 acres of good land, if, as I believe, it is only possible to have one-third under tobacco in one year. He must anywhere in the North-Western Provinces spend Rs. 10,000 to Rs. 20,000 in making wells, or he must pay for wells already made. He must build a bungalow and a curing house at a cost of not less than Rs. 10,000. I estimate roughly that altogether he would have to expend from Rs. 25,000 to Rs. 50,000.

53. I have shown that the margin left for curing, if tobacco sells at 5*d.* a lb., is small, and that the price must certainly be raised to 6*d.* or 7*d.* if any profit is to be hoped for in the North-Western Provinces under skilled superintendence.

54. But if cost of cultivation is reduced and curing is effected by the cultivator or farmer without foreign aid a very handsome profit may be expected, especially if either the native cultivator or the European planter is able to learn and apply an improved method of curing.

55. The cost of carrying wrappers from outlying curing houses would not be such a heavy percentage on the cost of the manufactured article as the cost of transporting fillers, which ought certainly to be grown in the vicinity of the factory. I believe that the cost of sending tobacco from Gházipur to Calcutta is nearly as great as the cost of freight from Calcutta to London, and it is evident therefore that it is important to have the factory as near as possible to the supply of fillers. It would be absurd to send fillers to Cawnpore, for instance, to be reconveyed after manufacture to Calcutta.

56. I am perfectly assured that the cultivators of no country in the world can produce and cure (on their own system, and if left to themselves) cheaper tobacco than the Bengal natives. If, then, it is found that their tobacco can be utilized on the spot in manufacture, profits must exceed profits in other countries so long as the cost of machinery and manufacturing is not greater. I am inclined to believe that these will not be greater, since a great deal of hand labour is required in a factory, and hand labour is nowhere cheaper than in Bengal, if confined, as it would be, to labour of manipulation.

57. On these broad grounds I am convinced that there is sufficient reason to set about ascertaining the fact whether native leaf in the tobacco-producing districts is good enough, or can be made good enough, to be utilized for manufacturing purposes.

PROSPECTS OF TOBACCO ENTERPRISE.

58. The following is an outline of the system which it appears to me that circumstances require. A large factory or factories should be established in the heart

of a tract in which natives are accustomed to grow tobacco, and in which the cost of cultivation is as small as possible. Irrigation must as far as possible be avoided.

59. A small farm and a curing house under skilled American supervision is required for the production of high class leaf, which may be utilized as wrappers.

60. Indigo planters and others should be encouraged to aim at the production of a similar high class tobacco, either to feed local factories or to export to Europe. They will possibly not succeed in preparing high class wrappers for some years, but they will at any rate produce (as some of them have already) a *very good* filling leaf.

61. Native-cured tobacco should be utilized, if possible, as fillers. If it is found that natives can be taught to improve their system of curing, through the influence of skilled instruction, so much the better. There is little doubt but that in time it *will* be improved by instructions, but natives are so slow to move that I suspect that for some years their tobacco must be accepted as it is. All that we can do at present is to ascertain where the best tobacco is grown and cured; go there, and utilize it as far as practicable for manufacture.

62. The outline which I have sketched, indefinite as it may be, is sufficiently clear to shadow forth the direction in which progress may be hoped for. The experiments which we are now making form part of a pioneering enterprise, and the first results which we must expect from them are not so much financial success as an indication of the path along which our next steps should be taken, and of the field which our enquiries should now cover. The system which I suggest has, at any rate, the broad basis of experience, since it is practically that which prevails in Virginia, where planters and farmers feed with their produce the neighbouring factories.

COUNTRY BEST ADAPTED FOR FURTHER ENTERPRISE.

63. I regret to state that, as far as my present enquiries have carried me, I do not for various reasons consider any portion of the North-Western Provinces to be so well suited to the establishment of tobacco cultivation, curing, and manufacture as parts of Behar and Eastern Bengal.

64. The rough outline map opposite indicates the area which has been eliminated, I believe, by a process of natural selection as the best tobacco-producing tract of India. Its merits appear to consist chiefly in the following circumstances:—

(1.) It is below the frost line.

(2.) It is moist enough to require but little irrigation and to allow tobacco leaf to be handled with tolerable facility.

(3.) It is the coldest part of India which satisfies the above conditions.

The first two circumstances require no explanation. I must say a word or two about the last.

65. The Virginia curer is satisfied by his American experience that the best flavoured tobacco for smoking is grown in a cool, temperate region. He states confidently that this is a recognized fact in his country, and that whatever may be the case as regards cigar tobacco, a moderately cool climate produces a better smoking and chewing leaf than the more tropical regions. His own instincts, derived from his knowledge of facts, lead him to prefer a somewhat hilly tract of land.

66. If this view is accepted (and it is borne out by the analogous case of European vegetables, peaches, and other exotic produce, which acquire a much better flavour in the northern than in the southern limits of their growth), it becomes apparent why the tobacco already most valued in the market should be that which comes from Tirhoot and East Bengal. The weather from November to February, when tobacco is growing to maturity, is in that tract cool and temperate. It is certainly a fact that tobacco is grown in some parts of this region over enormous areas, and that in travelling through

it a tobacco field is as ordinary a sight as a wheat field in the doab of the North-Western Provinces, where the plant can only be found hugging rich nitrate wells or forced up on the heavily manured suburban lands of large towns.

67. It may be argued that if the theory about climate is correct, it will be well to try further north still. The answer is that the attempt will be barred by frost and extreme dryness. I am of opinion certainly that tobacco may do very well in the eastern districts of the North-Western Provinces, which are adjacent to Bengal, and perhaps also along the belt of land underlying the Himalayas (both in the North-Western Provinces and Oudh), which tracts are not affected by great aridity of climate. But the extension of tobacco cultivation in this direction must be a work of time, and at present it will be extremely undesirable to add to other difficulties the greatest difficulty of all, *viz.*, the introduction of tobacco-growing on a large scale amongst an agricultural community who have never tried it. The cultivation of tobacco is not like that of indigo, a simple matter. The greatest care, skill, attention, and labour are necessary to its successful production.

68. The only section of the North-Western Province land in which I have personal knowledge of anything approaching to constant and extensive tobacco cultivation is the suburban area of Farukhabad. There are similar areas (though I doubt if they are so large) round Meerut and Jaunpur, and perhaps round some other large towns with which I am not acquainted. Farukhabad is probably pre-eminent amongst them, and there I have good reason for believing that less than 1,000 acres are under cultivation annually, while I do not think that cultivation could be extended outside the suburban and highly manured ring of land. There is therefore no prospect of finding any field there for a large factory, nor any hope of an encouragement of the town cultivation acting as a leaven to the district in which difficulties of climate, irrigation, and manure prevent tobacco-growing on a large scale. A further objection is that the tobacco raised on town land is of the nitrogenous and highly acrid class, which is unsuitable for European manufacture. But the strong acrid leaf which finds so much disfavour in a European market fetches in India a good price, often Rs. 8 to Rs. 10 a maund, on account of the very qualities for which it is disliked at home. It is not likely therefore that the cultivators would readily substitute the American method of cultivation, which would not permit either the use of so much nitrogenous manure or the production of a very heavy crop, unless they were compensated by what would probably prove an excessive price.

69. These are the reasons why I doubt whether much can be done with suburban tobacco patches of the North-Western Provinces, and why I recommend that pioneering enterprise should first seek the tobacco country of Tirhoot and East Bengal. I regret much that I should feel myself obliged to suggest any measure which would tend to lead tobacco enterprise out of the North-Western Provinces, but I feel that in the cause of tobacco progress I am right.

PROPOSALS AND SUGGESTIONS FOR THE CONSIDERATION OF GOVERNMENT.

70. If Government accept the view that the course which I have indicated is likely to be the proper one to pursue, the first step which should be taken is, in my opinion, the critical examination of the tobacco of Tirhoot and Bengal, and the conditions under which it is grown and cured.

71. For this purpose I would ask permission, with the concurrence of the Bengal Government, to visit any part of the Tirhoot and Bengal country in which I may consider enquiry desirable. With the consent also of Messrs. Begg, Sutherland, & Co., I should recommend that the curer be allowed to accompany me whenever he can be spared from his duties at Ghâzipur.

72. If conditions are found to be favourable to the adoption of the programme which I have suggested, I should recommend Government to propose to Messrs. Begg, Sutherland, & Co. that they should take measures to establish a factory in a suitable locality.

73. If Messrs. Begg, Sutherland, & Co. absolutely decline to co-operate with Government in making enquiries or to entertain the idea of establishing a factory, I would in that case only recommend Government to take independent steps to make the necessary enquiries and to invite the co-operation of other capitalists, whether Indian or American, in undertaking the enterprise.

74. It is due to Messrs. Begg, Sutherland, & Co. to make to them the first offer, and to support them throughout in keeping the lead which they have taken, if they still wish to keep it. I have not consulted Messrs. Begg, Sutherland, & Co. upon the questions raised in this note, which I have written simply in accordance with the conclusions at which the facts before me have led me to arrive, but I should think that they are likely to adopt much the same conclusions from a consideration of the same series of facts.

75. Gházipur is the first experimental platform upon which we have made a stand, in order that a better out-look might be obtained of the future prospect of the North Indian tobacco. The enterprise must not, however, be long confined within such a narrow circle, nor must its future success be gauged merely by the result of the Gházipur concern. There are difficulties there in the matter of irrigation and novelty of cultivation which would be removed in Bengal.

76. I do not now suggest any immediate action beyond the continuance of operations at Gházipur: but if the enquiries which I now propose are found to bear promising results, I will then recommend further advance of the character which I have described.

77. The declining condition of the indigo trade has made planters ready to accept any chance of improving their position by a new industry connected with agriculture. They are, I am credibly informed, quite prepared to take up with alacrity the cultivation and preparation of tobacco, if they are informed of the circumstances under which it will pay them to do so. And they are probably aware of the fact that tobacco and indigo could be cultivated and prepared side by side with great advantage. Tobacco can be raised on indigo refuse, and come into the curing house, which is ready to hand in the indigo godown, just after indigo has left it.

78. If, then, Messrs. Begg, Sutherland, & Co. accept any proposal which may be made to establish a factory, I am of opinion that the wisest thing they could do would be to encourage tobacco-growing and curing by an intelligent body of gentlemen, who would succeed far sooner in raising the article required by the trade than the ignorant and conservative natives. In any case the demand for tobacco is so enormous that competition in India, so far from being feared, should probably be welcomed, as tending to advertise and increase the East Indian trade.

79. I continue to advise the prosecution of the Gházipur experiment. It is as favourable a place for the curer to conduct his first attempts as any which can be found, and may turn out very useful as a place in which to produce leaf of a high class, such as natives and planters may not be able to cure. The Korantadhi stud buildings may eventually be utilized for a similar purpose, and for that reason I have suggested the retention for the present of some of the stables.

80. In conclusion I wish to place before Government this question for their consideration. If conditions prove to be sufficiently favourable for the establishment of a tobacco factory in North India, what encouragement is Government prepared to give to it? I do not myself consider that any assistance of a positive character is

necessary. I do, however, strongly advise that a distinct promise should be given that no export duty will be charged, say for a period of 20 years, and that no inland revenue will be charged, say for a period of 10 years. I do not think that any measure would conduce to the speedy advance of the enterprise so much as a promise of this nature, and one reason why I have described at such length the circumstances connected with the possible future of the trade is, that Government may have ample time to consider what form of encouragement they will be ready to give to it when the time comes to ask them for assistance.

I have the honour to be,

SIR,

Your most obedient servant,

E. BUCK,

Director of Agriculture and Commerce, N.-W. P.

No. 179.

No. 9. 1 2 8 / 22

From

C. J. LYALL, Esquire,

Under-Secretary to the Government of India,

Department of Revenue, Agriculture

and Commerce,

To

The Secretary to the Government of

Madras

Agri. & Horti.

Simla, dated 5th July 1878.

Sir,

I am directed to forward for the information of His Grace the Governor in Council and for communication to the Superintendent of the Government Farm at Sydapet, Copies of the papers marginally noted, being reports by the Director of Agriculture and Commerce, North Western Provinces and Oudh, on the subject of the experimental cultivation and curing of tobacco at Ghazipur and in

* From the director of Agriculture and Commerce to the Government of the North Western Provinces No. 206 A / XXII-25 × 834 A / XXII-25 dated the 18th October and the 10th November 1876.

From the Dr. of Agri: and Commce to the Govt. of the N. W. P. and Oudh, No. 428 A / LVI dated the 6th May 1878.

in Kumaun in the North Western Provinces and at Pusa in Bengal.

I have the honour to be,
Sir,
Your most obedient Servant,

Chas. Hutchinson
Under Secretary to the Govt of India

23

Revenue 1878 Dept

No. 3216.

From

The Govt. of India

R.M.C.

Dated 5
Rec'd 23 } July 1878

No. 179.

Eo. 3.

14 Feds Oaan Dep Oaan

Memorandum for information reports by the Director of Agriculture and Commerce N.W.P. and Audh. on the subject of the experimental cultivation & curing of tobacco at Ghazipur, Kumaun, & Poona. —

Md 7/8 1878

No 1212

Forwarded to the Board of Revenue for communication to the Suprt. Govt Farm.

2 August 1878

With Order

No 9 -

C 31-7-78
R 1-8-78