

14. Scott. II-27-16,804-21-10-27.
Educational (1945) Department.

Mes SERIES.

G.O. 76 mis

DA 25-1-1915

[Despatch Abstract.]

Industries

Recording notes written
by Sir Frederick Nicholson Hov.
Director of Fisheries in regard
to feasibility of starting
cane and glass making industries
this presidency.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

Page No.

D.O. No. 3285 C/14.1 d 22.12.14

Dear Sir Frederick,

I am directed to

acknowledge with thank the receipt
of your D.O. No. 28 d 15.12.14
regarding class industry &

regarding paper manufacturing
in this country. 19.12

Yr. Servant
T. 12.14

Nicholson, K.C.I.E.

22 DEC 1914

According to the present
distribution of business in the
Secretariat these industries fall
to be dealt with in Education
not Revenue; so I shall not
be personally concerned with the
future of any experiments in
that direction

D

DEPARTMENT.

CURRENT No. 3285.C.

From Sir F. A. Nicholson.

Received 18-12. 191 4. Registered 18-12. 191 4.

Subject.

D.O.

Fisheries Bureau,

Common
Circular, dated, 17 Dec 1914

My dear Davidson 3
I send herewith
a D.O. note on the
prospects of a glass
industry in the Pres 2.
I can not at D.O. as it
is not an official document
for publication, but solely
a note containing my
personal views for the
information of Govt.
Possibly my suggestions may
be of use when industrial
matters are discussed.
They are not new views,
but those which I have
themselves on me during
many years of industrial
thinking: I am, myself,

DEPARTMENT.

CURRENT No. 3285.C.

From Sir F. A. Nicholson.

Received 18.12. 1914. Registered 18.12. 1914.

Subject.

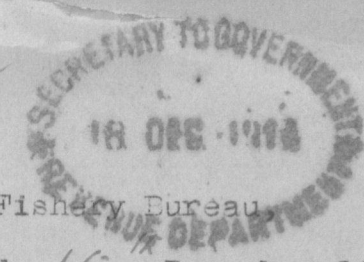
very keen, at one time,
(from early Service in fact)
in getting up glass, pottery,
paper, & other industries,
^{with} ~~amongst~~ which I had been
to some extent familiar
(& encouraged) in youth,
but I did not in ~~any~~
way to any chance of
success. In the reasons
I set out in my Note.
I am sending you another
in a day or two. in
paper-making which, as
regards coarse & semi-
manufactured goods, is
more promising, just
because raw materials
are indigenous, abundant,
& of good quality, while
little fuel is required;

but an expert mummy is
~~just~~ required to establish
(1) the necessary production
of raw material in quantity
in given localities, (2) in
developing the processes
suitable to the specific ma-
terial.

I am also send a brief
note on pencil making,
merely because the history of
that attempted manufacture
clinches my arguments
against glass (as ^{it is} paper
without further expert enquiry)
& strengthens my arguments
for the oil & fat industries.
Yours sincerely,
F. A. Nicholson.

D.O. 2028

2



Fishery Bureau
Dated 15 December 1914.

My dear Davidson,

I have been reading some ^{official} notes on possible industries and the steps taken with regard to them. One of them is on the glass industry and the remark is as follows:-

"I am in treaty with the proprietor of the late glass factory with a view to starting experimental manufacture" (in G.O. No. 2802 of 26th September 1914); see also remark on page 3 in G.O. No. 3271 of the 13th November.

Glass is, on page 4 of the former G.O., placed in ~~the~~ category of "industries not at present carried on in India" but specially favoured by the economic situation." I am highly interested in glass manufacture and regret that I must deprecate the suggestions noted above.

2. I submit in the first place that the Madras Government should have nothing to do "experimentally" with the glass industry in general, and in the second place nothing to do with the unfortunate Madras Factory. I do so because I have some knowledge of the ^{practical} technology of glass making and of its business aspect, and of its special difficulties in this Presidency.

First, then, I submit that the technology of the glass industry and its practical manufacture are perhaps the most difficult of any industry whatsoever; it involves, in its Superintendents, great practical knowledge of inorganic chemistry in general - and of the many compounds called glass in particular, together with that power of adapting methods and combinations to new conditions and new materials which is born of complete knowledge of the manufacture and ^{of} its technology, as well as of the commercial side of the business; in its foremen it requires great practical knowledge in all branches

2 3
6
Obtained by long apprenticeship to the actual manufacture, and for its staff it requires a body of artisans skilled from youth in this particular branch of work. Have we in this Presidency a such persons whether for Superintendents, Foremen, or working artisans? If not, it is worse than useless to attempt glass making, and any attempt to introduce a staff would ^{be} ruinously expensive and end in utter failure.

The "secrets" of glass making are numerous, meaning by "secrets" not merely the exact formulæ, which indeed are largely secrets in each factory, but the thousand and one manufacturing dodges or devices in the carrying out of the various processes. None but the most practical and experienced ⁸ men can make good or -- what is equally important -- cheap glass. In Tokyo I saw at the Industrial Museum the best Japanese glass available; it was but very second rate though the Japanese, Government and private persons, had spent scores of years in studying and practising the art at the best European glass centres and with ^{local} European ~~instructors~~ instructors, and this though Japan has excellent and cheap materials, cheap fuel, a temperate climate, and most painstaking and intelligent workers in all grades.

3. Secondly, I say at once that this Presidency is entirely devoid of the proper raw material ^{for} glass, unless we are to confine ourselves to coarse goods such as bottles and glass tiles.

(a) fuel This is by far the most important factor in glass making; I do not exactly remember how many tons of fuel are required per ton of finished glass, but it is the largest and weightiest and costliest item everywhere. In Great Britain glass factories are always placed ~~under~~ near coal mines, for without cheap fuel, glass manufacture, as a general industry, is impossible. At Nailsea, near Bristol, there are several deserted glass factories alongside of several worn out coal mines and this though there is plenty of coal only 20 miles away near Bristol; the glass factories have removed to Bristol. A very small

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difference in the price of coal will make or mar the glass industry. What chance has Madras with coal at Rs.20 to 25 per ton - and poor at that - or wood at one-third of that price which means the same in calorific cost, against ^{British} pit-head prices, to say nothing of the handicap mentioned in my first point, and the ^{British} advantages of a going business?

(b) Sand and other ingredients. Except for bottle glass, pure white sand free from iron, etc. is essential. There is no such thing in this Presidency ~~and~~ so far as my knowledge of many district goes, and I have been specially interested because I have ^{searched} ~~enquired~~ for iron-free materials for pottery purposes; Mr. Chisholm at the School of Arts also ^{encountered} ~~this~~ difficulty. Hence, ^{pure} unless white quartz is used, colourless glass is impossible.

Hence the glass industry in this Presidency will necessarily be confined, in general, to the coarsest and cheapest qualities, in which case, ^{moreover,} ~~where~~ the fuel item will be a disproportionately high factor of cost, so that it is precisely in such cheap lines that foreign glass will successfully complete. In Great Britain such goods are made profitably only by the existence of ^{cheap} ~~cheap~~ fuel used in the most economical way, and by utilising, as far as possible, waste products, such as slag, broken glass, etc.

(c) All or most of the Alkali materials for glass have to be imported, an additional item in cost. Nowhere are they so cheap as in Great Britain, Germany, and Austria. Compare the ^{local} ~~cost~~ prices in Great Britain for Alkali and the prices in this Presidency.

(d) The raw materials have to be transported for great distances; this has been partly noticed under (a) and (c). In Great Britain the lead, whether for fuel or other materials, is trifling.

4. Thirdly. Except in the item of bangles there is no real market ~~for~~ of any size for the goods which could be made, even if they were cheaper than European goods; soda water bottles and a few glass tiles will not warrant or make an industry. I once asked the defunct factory if it would make me plain glass jars for preserving fish, but they ~~are~~ declined.

5. Fourthly. There is for glass making in general not

5

There never

not only no expert staff available but ~~these men~~ will be under present conditions, for the simple reason -- which was one of those which wrecked the Madras factory-- that no one can face the heat. When in England it is all that men can do to face all day long white ~~hot~~ ^{hot} furnaces to deal with white or red ~~hot~~ ^{hot} material and with implements such as the almost red ~~hot~~ ^{hot} metal moulds for blown or pressed ware, is it likely that we shall get a race of Salamanders who ~~xxxx~~ will face the same factory conditions persistent night and day, in a climate where for 6 months (Madras) ^{the natural temperature} ~~it~~ may range close to or considerably above 100° F. ~~Without~~ ^{Without} an expert European staff of instructors, foremen, etc. the industry cannot be established, and no Europeans can stand a glass factory under Madras conditions, especially coming out at a mature age.

In brief, ^{general} glass manufacture can only exist where coal, alkali, and materials are at ^{their} ~~this~~ cheapest and best, and where there is an expert staff to instruct and guide the workmen under conditions physically endurable; not one of these conditions is found or ever will be found in this Presidency.

6. It is these various difficulties inherent in the conditions of Madras, that caused the failure of the defunct Madras factory, the failure of which I deeply regret, but a failure which was fore-doomed by the conditions.

In any case it is obvious that where a company with a certain amount of general knowledge and capital, has utterly failed, notwithstanding the importation of European experts and the large Government concession of free fuel, the first thing to be done before "taking over" a factory or "starting experimental manufacture" is to ascertain from the company's books, the several causes of failure; I am persuaded that the difficulties I have mentioned, including and involving the inability to compete with Western goods, will be found to be the active causes of failure, and causes which cannot be combated.

7. There seems to me ~~that~~ but one solitary and but very slender chance of establishing a general coarse glass industry

5 9
in this Presidency, viz. ^{to} attempt it on the Nilgiris. At the Industrial Conference of 1908 at Ootacamund, Mr. Brasier, as Conservator of Forests, stated that the eucalyptus on the Nilgiris grows so luxuriantly that, in ten years from planting, one may cut ~~1~~ 100 tons per acre, so that if 1000 acres were properly planted in ten blocks one might, at the end of ten years, begin cutting at the above rate at one block per annum, and continue cutting indefinitely; ^a casurina, on the Madras coasts, might produce fifty tons per acre, while natural forests would only give eight or ten; I write from memory. If so, and if, as I have said, fuel is the largest and ~~with~~ weightiest item in the manufacture, it might be better to take the sand, ^{alkali} ~~alcohol~~, etc. to the fuel, instead of the fuel to the sand; this would be ^{parallel} ~~the parallel~~ to the European habit of establishing factories close to coal mines. Moreover, in ~~the~~ higher Nilgiri ranges the climate would render European working possible. This is ^{the} one possible exception to ^{the} general impossibility, but it is only a slender chance in view of other difficulties. It would be necessary in such case to prepare for a glass factory by obtaining a large suitable area and ~~planting~~ ^{planting} it up years in advance with eucalyptus; when the fuel was in sight it would be time to start the factory. But I would not take a share in it.

8. The above are my ~~my~~ reasons for deprecating the waste — I fear — of money and energy in attempts at glass making ⁱⁿ ~~in~~ general; attempts by non-experts to do what experts, ~~working~~ ^{previously} ~~previously~~ working commercially, have failed to do. If an enterprise, ^{previously} worked at experimentally (at Ennore) for several years, fairly well ^{financed} ~~financial~~, operated by business men, and worked by Austrian experts, absolutely and entirely failed on a factory scale, are Government officers who are not glass experts, likely to succeed better experimentally or commercially?

9. There is one special item in which Government might

re-establish an ancient indigenous glass industry by suitable concessions or encouragement, viz. the glass bangle industry. In G.O.No.2802, dated 26-9-'12 the value of glass bangle imports is put down at 6.7 lakhs annually; I assume this to be correct and that all entries of bangles refer to glass bangles. When I entered the Service this import did not exist, and it is a significant argument in support of my previous ones supra, that Austrian glass bangles, cheap and fragile to a degree, have been able to oust an existing indigenous manufacture. When Collector of Anantapur almost thirty years ago, I had excellent opportunities of observing the then existing industry (near Penuconda I think); the Indian artisans made excellent glass bangles of a saline earth which, being very fusible, was melted at merely a bright red heat in large red-clay crucibles ^{fuel} piled in tiers inside large conical kilns fed with ~~fire~~ from below; the men were in no way exposed to heat as the glass was not worked from the kilns, and the amount of fuel used though considerable, was not great owing to the ready fusibility of the mixture. When the kiln cooled down, the cold crucibles full of solid glass, were removed, the glass broken out, and the artisan work then began, viz. the remelting in small quantities over a charcoal stove of the coarse green glass, and the working of strips or thin rods of this glass into circular bangles with the simplest of tools; women were equally employed with men in this ingenious industry. The public ~~are~~ ^{or} at least the bangle sellers, preferred these bangles as the glass was tougher than the brittle imported ones, so that fewer were broken in forcing them on to the feminine wrists, but the amazing cheapness of the foreign article coupled with the increasing cost of fuel and bangle earth — due partly to fuel exhaustion and partly to Forest restrictions — resulted in the ousting of the indigenous industry.

10. This industry might be revived if Government can see

their way to concessions

7. 8 11
their way to concessions and encouragement; no other direct assistance is needed, so far as my memory goes, than such concessions as would enable the men to get really cheap fuel (wood and charcoal), and the saline earths required. But whether it would survive after Government concessions as to fuel are withdrawn and after European competition again sets in, I doubt. Perhaps the best form of fuel concession would be the establishment of fuel reserves, planted ad hoc, in which the concessionaires/might be allowed to cut under supervision so as to ensure a perpetual supply; saline earth should also be freed from all quarrying dues if they now exist. But I doubt whether any industry, thus spoon-fed, will long survive if left solely to indigenous enterprise, and it is possible that the Department of Industries might successfully turn ~~their~~ ^{their} experimental efforts in this particular direction; the industry is indigenous, the knowledge and the artisans are still in existence, the processes are simple, and the demand considerable. But for this form of the industry, modern factories, with high-power regenerative gas furnaces and all the elaborate and costly plant of a glass factory, are not only not needed but undesirable; it is possible that ^{the} ancient conical kiln may be improved, but even this is doubtful as it greatly resembles the regular pottery kiln of Western *potteries* and a very moderate heat is needed, while the plant for making the bangles is of the simplest and cheapest. It will be noticed that there is no exposure to the heat of great furnaces; beyond occasional placing fuel in the hearths of the kiln the men do no work in heat, and the actual glass working is done not from huge white hot crucibles or tanks in a ~~plant~~ ^{cloud} factory, but from small pots of glass remelted over a small fire in a shed or cottage.

Yours sincerely,

F. A. Nicholson

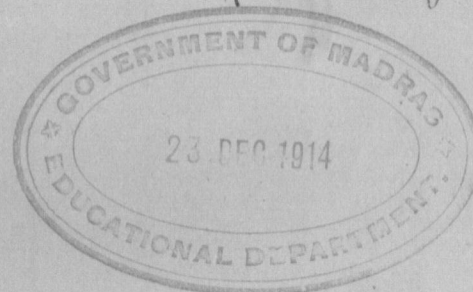
The Hon'ble Mr. L. Davidson, C.S.I., I.C.S.,

Ag. Secretary to Government, Revenue Department.

p. 5 of S.O. No. 2802 Rev K
26.8.14
p. 3 of S.O. No. 3271 Rev L
13.11.14

Sri F. Nicholson's D.O. regarding
paper manufacture has been added
to the file (pp. 15 supra). This has also
be transferred to Educational. Some
papers relating to the Pinner paper
factory referred to in the D.O. were
transferred to Educational on 8.12.14.

KRe
19.12.14
19.12.14
(Papers about paper
manufacture have
been put in a separate
file.)
PK



Rev. No 3285C/14-2
23.12.14

CNo. 4026 EdL

9/26/12/14

To Under Secy.

A draft D.O. to Sri F. Nicholson
acknowledging the receipt of his note is submitted.

2. On 12.8.14 Mr. Trevelyan promised to submit
a special report on glass industry. Main on 14.10.14
he wrote that he was arranging for the glass work
in Madras to be placed at his disposal and that
he had asked Mr. Erlam Smith of the Presidency College
to let him have a report on glass making. Mr. Trevelyan's
further reports proposal for the establishment of an
experimental glass industry will according to the
present distribution of work have to be dealt with
in Educational to whom Sri F. Nicholson's D.O. may
be transferred.

KRe

18.12.14

Sec

18.12.14

Yes: please.

21.12.14

To Under Secy.

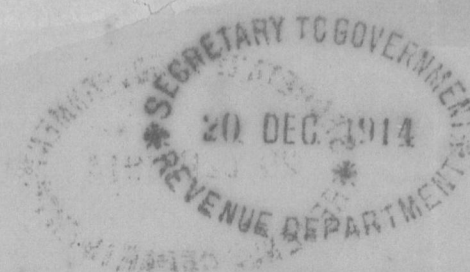
A further Communication received from Sri F.
Nicholson regarding glass and paper industries has been
added on to the file which may now be sent to
Educational. Slight alterations have also been made
in the draft D.O.

KRe

21.12.14

22.12

Edu. dept. - uo



CN. 3307.C

Regd. 21-12-14

Coonoor, dated 18th December 1914

13

My dear Davidson

In my notes to you re manufacture of glass and paper I pointed out that in each case there have been industrial-commercial attempts at manufacture, so that these specific industries are not in the purely experimental stage; consequently the first thing to be done is not to try experiments in glass or paper manufacture but to get hold of all the papers relating to the failed attempts, ascertain the precise causes - if possible by means of experts - and then, if so advised, to start afresh in the light of the experience which has been obtained by the failures. In the case of glass I mentioned my belief that success is almost impossible, except as regards bangles by reason of dear fuel, tropical climate and inferior materials, but ~~that~~ an attempt at third class goods might possibly succeed by taking the materials to the fuel on the hills. As regards paper I suggested a survey by ^{an} expert - scientifically and practically acquainted with the ~~raw~~ raw materials and with the conditions necessary for practical manufacture either of paper or of half stuff, ^{so} that we may know for certain whether we can ~~make~~ ^{ever} make paper in this country and if so of what character, and whether the manufacture of half-stuff will not, at present, be our main duty.

2. As regards pencil making we are, I submit, in the same case. Two pencil factories have been started with some flourishes (one at Anakapalli) but neither seems to have succeeded. Why, is exactly the question, and the answer to that should be obtained before moving a step towards experiment. I dont profess to know much about pencil making but I do know this, that it is almost a hopeless task in this Presidency;

(1) Indian (Travancore, etc.) "black lead" (graphite, plumbago)

is of a very inferior quality, good for making plumbago crucibles (Morgan & Co. have I think almost a monopoly of Travancore plumbago for their crucibles) but useless for pencils. It is impure and full of grit, and requires the most careful chemical and physical treatment by experts to fit ^{it} at all for the commonest class of pencils; good ones can never be made of it. The treatment costs money, and that cost would of itself abort an infant industry which has to compete (1) with far better graphites in Europe (2) with a going industry provided with every manner of machine, expert, and organisation which enables not only common but quite good pencils to be turned out at ~~absurdly~~ ^{absurdly} cheap rates. Not only so, but unless the "pencil experts" out here have been expressly trained to deal with third class graphite, they will be helpless when asked to make such graphite fit even for common pencil work.

(2) Has any wood yet been discovered near the factories or in the Presidency which is really suitable for pencil work, or at all comparable to the so-called "Cedar" (really American Juniper) to which we are accustomed? The Indian pencils I have seen are conspicuously bad in their wood; proper wood has to be light yet strong but not tough, with straight grain and easily cut; have the 'experts' found Madras timbers of such character?

(3) I doubt the possibility of in any way competing with European goods in price or quality; we are up against excellent graphite, excellent wood, excellent artisan skill and excellent industrial organisation resulting in good ~~prices~~ pencils at really absurd prices. The cost of freight from Europe is so trifling compared with the considerable value of the article that it hardly counts in the comparison; I mean, a ton of pencils contains so enormous a ~~number~~ ^{number} that the freight, per gross even, is absolutely insignificant, and weighs not at all when compared with the European

European advantages above mentioned. Moreover in this Presidency the graphite, wood, and fuel are usually so distant (one or other at all events) from the factory that the ocean freight of finished goods may even be less than the gross transport charges on bulky raw material. We have cheap labour out here, but most of the work is done by machines which can be run ~~by~~ far cheaper in Europe, while the cheap labour of this Presidency is seldom really cheap, for if of very low price it is careless and ineffective, and if skilled, it costs, efficiency considered, practically as much as European labour.

3. I have not, of course, been pessimistic as regards the above three industries otherwise than because I know of the gravest obstacles to their establishment and am unwilling to see money, time and energy spent without at least suggesting those obstacles. I conceive that attempts to start or even encourage industries of a most complex and costly nature without very complete expert knowledge is most dangerous; I do not know of any industry so entirely technical, so excessively difficult to work in this Presidency as glass, as hinted after my visit to Japan, in paragraph 235 and foot-note thereto of my "Note on Japanese Fisheries"; about paper we equally know nothing at present and only a paper expert can instruct us. It is the rule to take the line of least resistance, and I have for that very reason taken up "Fisheries" as an indigenous industry requiring only ~~the~~ ^{in method} development (difficult enough, after all); for the same reason I have advocated the oil and fat and linked industries as industries in which the bulky raw material is not only indigenous but of the finest qualities and universally abundant, while the processes themselves demand comparatively simple plant, very moderate amounts of fuel and of imported materials (such as alkalis which need not always be imported), and very little

little skill beyond that of the expert manager - of whom Government already possesses a man trained in the practical technology of oils and soaps - a good foreman, and an ordinary mechanical engineer. Moreover the oil industries if locally established would yield great economic savings, improve our agriculture, and develop the manufacture at very cheap rates, of most necessary edible fats as butter substitutes.

Yours sincerely,

F.A. Nicholson.

To

The Hon'ble Mr. L. Davidson, C.S.I., I.C.S.,

Secretary to Government,

Revenue Department, Madras.

P.S. Since writing the above I have seen the article on pp. 380-81 of the "Indian Trade Journal" for 3rd inst. I see that it mentions some of the facts which I have noted above; also that Indian graphite is so bad that graphite has to be imported (!) for so-called Indian pencils. I see also that Indian pencils are very cheap: they are also very bad. The processes for improving bad graphite into pencil graphite of ^{fair} ~~good~~ quality, are more elaborate than as stated in the article, but such graphite can hardly be made into really good pencil graphite. I am informed that Ceylon graphite is better than Indian graphite.

F.A. Nicholson.

15-11-14.

Educational Departt.

In his first communication ~~to~~ ¹¹ Sir Frederick
 pages 2 to 8 ^{supra} Nicholson points out the difficulties in
 the way of ~~undertaking~~ ^{the} glass making
 industry in this Presidency. In his second
 pages 10 to 13 ^{am} d.d. he places before the Govt. certain facts
 which go to show that pencil making
 industry in this Presidency would not be
 a practicable undertaking. ~~Has he~~
~~dissuades the Govt from considering~~
~~the two questions.~~ It is for consideration
 whether these communications may
 be forwarded to Mr. Trevelyan for
 an expression of his views thereon,
 though Sir Frederick does not intend
 them to be official communications.

CA
 4.1.15

I think that the Govt.
 may wish to advise, see the
 papers. They may be sent to him.

M
 9.1.15

Circulated in Bore No 26
 9.1.15

A. G. S.

P
 11. 1. 15.

gpa

Colno 4026-1
12.1.15

16.1.15

one pencil
kept below
in a cover.



18
John Parker Co for
pencil and return.

RR

12.1.15

Perused. is Indian Suppld glass making, pencil manu-
facture or an impossibility. He makes out
a long case, which I am not asked to remark on
to ~~dispute~~. I however enclose the "impossibility":
by a sample packet of pencils made by me. I hope to submit
further logical impossibilities shortly. RR.

Ed. Department

Submitted.

SK
16.1.15
RR
16.1.15

I advisedly refrained from
asking Mr Parker to offer any
remarks under Frederick Nicholson's
notes on glass and pencil,
as they would have served no
purpose at this stage. Should
Mr Parker make any definite
proposals in regard to either, they

19
 will of course be completely
 scrutinised, and in the most
 valuable notes sent I am sure
 the Com. in hand. In the mean-
 while has had the advantage
 of being able to have to do with
 against either experiment by
 a high authority like Sir Frederick
 Nicholson. No further action
 appears yet has been taken.

[Signature]

18.1.15

H. E. and others

P.

19.1.15

I have got one of Mr. Tressler's white pencils, and have been
 using it for a fortnight. It is quite good for the price.

Alf
 20.1.15

Sir Frederick Nicholson now says it is im-
 possible to make pencils in India: his case is
 that they cannot be made at a price which will
 enable them to compete with imported pencils.

Mr. Trester has still to show us that this is possible.

He
21/1

22-1-15

Recorded
23-1-15

Transf. be on separate sheet plus 207

have to over Mr. Trester. What pencil
name it is a faintly. It is quite good for the time

” ” ” ” ” 191

CK No. 4026/14 From the Rev. Dept., No. _____, dated _____ 191

” ” ” ” ” ” ” ” 191

No. 76, dated 25-1-1915

Mr.

Recorded

(20) P. R

23. 1. 18-

REMARKS.

When given for copying—

When copied—

When examined—

When signed—

192

READ AGAIN G.O. No.
192

, DATED

CURRENT No.

LOSURES TO C. No.

OF GOVERNMENT

.. A A A A A A A