

Public (1899) Department.

ORDINARY MS.

G.O., No. 1304

Dated 20/11/88

INDEXED.

[Despatch Abstract.]

Commr. to the Surgeon-General for the
necessary action letter from the Govt. of India
forwarding copy of certain papers regarding
the supply of spare parts for the polaris-
copes in use in India

CHIEF SECRETARY
8 - NOV. 1899
MADRAS

The Government of India,
Finance & Commerce Department

Order Endt: Mis.No.3863 Rev.

Transferred to the Public Department in continuation of G.O.No.3676, dated 23rd October 1899 for favour of communication to the Chemical Examiner.

(By Order)

J. E. M. A. P. O. B. A. L. L.

Ag. Under Secretary to Govt.

Fort St. George

6th Novr. 1899.

Recd 18-11-99

encl: 2 (Tues)

Recd in NY co 6 PM

To

The Public Department (with 2
copies of encls.)

Copy to the Board of Revenue (S.R.)
(with 1 copy ^{each} of encls.)

12/12

Dated 26th October 1899.

Received }
Registered } 1st Novr. 1899

Enclosures 2

Spare copies.

15/11/58

SUBJECT.

Forwarding copy of certain papers regarding the supply of spare parts for the polariscopes in use in India and requesting that the papers may be communicated to the Chemical Examiner.

BACK PAPERS.

G.O.	No.	Department.	Date.
1235	71-11	U	
1190	91	U	
1041	91	U	
716	91	U	

FURTHER PAPERS.

G.O.	No.	Department.	Date.

No. 956-3, dated the 2nd August 1899.

From—The Chemical Examiner, Burma,

To—The Chief Collector of Customs, Burma, Rangoon.

I have the honour to acknowledge receipt of your letter, Customs Department, No. 372-5, dated 24th July 1899, together with a polariscope as received from London.

I. I am not able to use the instrument at present as it is without the following essential parts:—

(a) Quartz control plates.

(b) Standard measuring flasks.

The standard measuring flasks which ought to hold 100.06 cubic centimetres at 17° 5c. should be verified at some recognised station as an error of 0.1 cubic centimetre in the graduation introduces an error of $\frac{1}{10}$ per cent. in the determination of sugar. Apart from the above, which are essential to the apparatus, a number of spare parts should be provided, as an accident to any single piece of the apparatus as provided renders the instrument useless until the damaged piece can be replaced. The spare parts which are so necessary as to be practically essential are (a) the cover-glasses to the sugar tubes and (b) the rubber rings in the sugar tubes, as the latter rapidly deteriorate in a tropical climate, and the cover-glasses become optically active if unduly compressed and are then useless for some days. In my opinion the full set of apparatus, which ought to be provided for every testing officer, is—

(a) The polariscope.

(b) A suitable lamp.

(c) Quartz control plates with correction tables for temperature.

(d) Two 200 rum-tubes.

(e) Two 100 rum-tubes.

(f) Six standard measuring flasks.

(g) Four spare cover-glasses for the sugar tubes.

(h) Six spare rubber rings for the sugar tubes.

(i) A nickel basin with spout and counterpoise for weighing the sugar.

II. I am not quite clear in what light I am to regard the directions for testing, extracted from the trade journal "Sugar" of 6th August 1891; that is, whether they are to be taken as official directions or merely as guide to the general methods to be adopted. I think, for the sake of uniformity at the different ports, the same methods should be everywhere adopted and the only point in which there is likely to be any difference is in the methods adopted for clarifying the sugar solutions. In this connection, I think that the use of alumina cream alone might be allowed, as it seems to be recognised by practically all authorities that for a well refined sugar it is quite efficacious while sugars of inferior quality require subacetate of lead in addition.

Another point on which there ought to be a definite ruling is the condition in which the sugar is to be weighed. If it is weighed air-dried, it will, during the rainy season, shew less sugar than during the dry season; for instance, a sugar which polarizes at 98.4 per cent. examined in March might well give under 98 per cent. if examined in July. The obviously accurate method is to determine the percentage of sugar in the sample dried at 100 C., but to do this would probably cause complaints from the importers, who might fairly insist that a small quantity of moisture is naturally present in all sugars.

III. I shall be glad if you will forward this letter to the Government of India through the proper channels.

No. 156-S.R., dated Simla, the 17th August 1899.

From—J. B. BRUNYATE, Esq., Under Secretary to the Government of India, Finance and Commerce Department,

To—The Assistant Under Secretary of State for India.

I am directed to acknowledge the receipt of the letter from the Director-General of Stores, No. S.-8755, dated the 28th July 1899, regarding the supply of quartz plates and tables for the polariscopes sent to the Collectors of Customs in India, and to say that the officers at the various ports are being asked to act on the directions contained therein, and it is hoped that these directions will be of service.

2. Meanwhile, in continuation of the telegram to the Secretary of State of the 15th instant (marginally quoted), I

Letter from Director General of Stores, dated the 28th July last. Please arrange to send, as soon as possible, Collector of Customs at Rangoon, oil lamp and standard measuring flasks for polariscope. Gas not available at Rangoon for lamp already sent and flasks not received.

am directed to forward copy of a letter from the Chemical Examiner, Rangoon, No. 956—3, dated the 2nd August 1899, in which he suggests that every testing

officer using the polariscope should be furnished with certain spare parts of the apparatus.

3. The Government of India are not in a position to say exactly what spare parts are likely to be required for this instrument, but they would be glad if expert advice could be taken on the suggestions of the Chemical Examiner, Rangoon, and such spare parts sent out to the Collectors of Customs in India, as the authorities in England may think necessary. The Government of India would also be glad to be furnished with any further suggestions which your advisers in England may make in connection with the correspondence on the working of this instrument.

No. S.-10674, dated 28th September 1899.

From—E. GRANT BURLS, Esq., Director-General of Stores, London, S.W.,

To—The Secretary to the Government of India, Finance and Commerce Department.

With reference to your letter No. 156-S. R. of 17th August 1899, you will have learnt from my letter of 6th September 1899 that the oil lamp and measuring flasks for Rangoon have already been shipped.

2. I have referred the suggestions of the Chemical Examiner, Rangoon, to Mr. Halse, and I enclose, for your information, a copy of his reply, dated 14th September 1899, together with a copy of a report, dated 20th September 1899, by the Principal Chemist of the Inland Revenue Laboratory.

3. In accordance with Mr. Halse's recommendation, steps have been taken for the supply of the following for each of the polariscopes:—

3 observation tubes, 200 m.m.

1 „ tube, 100 „

12 rubber rings,

12 cover glasses,

1 nickel basin, with spout and counterpoise, and they will be sent to India as soon as possible.

4. No steps have been taken for the supply of the apparatus (sensitive balance, etc.) referred to in Mr. Halse's letter as forming part of all chemical laboratories, as, in the event of the work of testing being carried out under the supervision of the Chemical Examiners, the apparatus is probably already available. You will, however, no doubt inform me as to your wishes upon this point, and immediate steps will then be taken for the supply of any apparatus that may be wished for.

Encl. no. 2
to Pub. no. 5145973

5. I am in communication with the Principal Chemist of the Inland Revenue Laboratory with reference to the preparation of instructions, and I will address you further upon the subject in due course.

With reference to the copy of correspondence forwarded by you and relating to the use of the polariscopes recently sent to India, I have to observe that the connected apparatus or spare parts enumerated by the Chemical Examiner and Mr. Halse are necessary for the efficient use of the instrument as applied to cane sugar determinations. With regard to the use of the quartz control plates for correction purposes, I am of opinion that they should only be applied by some one familiar with the construction of the polariscope, and then only when there is an important deviation from accuracy. I think with Mr. Halse that it would in nearly all cases be better to slightly alter the weight of sugar taken (26.048 grains or such other weight as may be required by the higher temperature employed) until the instrument indicated 100 divisions for pure cane sugar in a 200 m.m. tube, and then altering the counterpoise weight accordingly.

After reading this correspondence, I am convinced that it will be necessary to furnish the officers who may have to employ these instruments with clear and definite printed instructions as to their mode of use, otherwise very serious mistakes will certainly be made.

It appears to me desirable that some expert on saccharimetry should now be invited to draw up full and precise instructions for the guidance of the officers engaged in sugar testing in India. These instructions should include a description of the method of verifying the capacities of the flasks, the mode of preparation of the sugar solutions, the precautions necessary in reading the instrument, corrections for temperature when necessary, and the use of the quartz plate, etc., etc., and they should be stated in such detail and in such language that they would be clearly intelligible to the Customs officials employed at the sugar testing ports.

If this meets with the approval of the authorities of the India Office, I shall be pleased to revise the draft instructions before final acceptance, and to ascertain practically, if necessary, whether they are likely to meet the end in view.

GOVERNMENT LABORATORY;

20th September 1899.

(Sd.) T. P. THORPE.

Dated 14th September 1899.

From—W. HALSE, Esq., 36-37, Mincing Lane, London, E. C.,
To—The Director-General of Stores, India Office, S. W.

I beg to acknowledge the receipt of your letter No. S.-10674, dated the 8th instant, regarding the supply of flasks and spare parts for the polariscopes sent to the Collectors of Customs in India.

The 12 flasks sent out to Rangoon have been graduated to hold 100 cubic centimetres at 60° F., Mohr's method. It is the duty of every chemist to check the accuracy of the graduation, or to alter the same according to the mean temperature of his laboratory, as it would be a source of error to make a solution at 17.5° C. and examine it in the polariscope at a higher temperature. Moreover, the graduation of the flasks must agree with the weights and other measures used in the laboratory. I may add that when the normal weight of chemically pure sugar is washed in a 100 c. c. flask and the latter filled up to the mark, the filtered solution when examined in the polariscope, at the same temperature and through a tube 200 m.m. long, should give a reading of 100%. If this is not the case, the weight has to be adjusted (reduced or increased) to attain that end. Therefore it is obvious that so very great exactitude, in the graduation of the flasks, is not necessary. However, it is most important that, having once adjusted the weight to the flasks, or *vice versa*, all the flasks used in connection with a polariscope should be graduated exactly in the same manner.

As regards the spare parts referred to in the letter of the Chemical Examiner, Burma, to the Chief Collector of Customs, Rangoon, No. 956—3, dated the 2nd August 1899, they are essential in a well-appointed sugar laboratory, besides various apparatus which form part of all chemical laboratories, such as a sensitive balance, mortar and pestle, wash bottle, funnels, filters, cylinder glasses, pipettes, flasks of various capacities, moist alumina, basis acetate of lead.

In my opinion one dozen rubber rings and cover glasses would be required for each testing officer. I would also recommend three 200 m.m. observation tubes and only one 100 m.m., as the shorter tube is only used for very dark sugars which would be a very small percentage of the samples received by each officer.

The object of using the sub-acetate of lead solution is to discolourise the sugar; consequently it would be useless, and would add to the difficulty of obtaining a bright solution when dealing with refined sugars. Alumina cream in very small quantities (5 or 6 drops) is sufficient.

The quantity of sub-acetate of lead to be added to raw sugars depends on the grade, 5 cubic cent. for first runnings up to 10 and 15 c.c. for lower grades. It is impossible to prescribe the exact quantity: however, it is advisable to employ the least amount that will produce the desired effect, for a voluminous precipitate will cause the polarisation to be somewhat too high.

A solution of the required strength is made according to the following formula:—

900 grammes Neutral Acetate of Lead.

560 do. Litharge (Oxide of Lead).

5 litres Distilled Water.

Digest for 6 hours on a water bath, stirring frequently; when cold, decant the clear solution.

I shall be glad to give you any further information you may require.

No. 4844 - S.R.
Government of India
Finance and Commerce Department.
Simla 10th October, 1899.

To
The Secretary to the Government of Madras
Revenue Department

Sir,
In continuation of the communication
from this Department No. 4519-S.R. dated the
4th October 1899, I am directed to forward a
copy of the papers noted on the margin.

es G.O. 3676
23.10.99
Hag W

- 1) Letter from the Chemical Examiner, Burma, No. 956/3
 - 2) Letter to the Asst. Under Secy. of State for India, No. 156 S.R.
 - 3) Letter from the Director General of Stores No. S.10674
- dated 2nd August 1899.
dated 17th August 1899.
dated 28th September 1899 & enclosures
- regarding the supply of spare parts for the polariscopes in use in India; and to request that with the permission of His Excellency the Govr. in Council the papers may be communicated to the Chemical Examiner.

Copy sent home
more will follow

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

W. B. Muzart
Under Secy. to the Govt of India

Enst. " " Revue de l'Inde " 3863 " 6. u. 1899.

..... 189 .

189

Order No. 1304 720-K-58
his

C.S.

Communicated to the

Sung Eon General in Com.

W. Kinnahan of Co. No. 1235

Public & 1. 11. 28 for

The necessary action.

Dec 15-1899
 J.W.C.
 16/11/99
 Dec 17/11/99
 1899

To The Surgeon General
(atb) with ^{page} the ~~box~~
set of enclosures, in origl.