Educational (1896) Department.

ORDINARY MS.

G.O., No. 241

Dated 13th Apr 1896

INDEXED.

[Despatch Abstract.]

PHYSICAL LABORATORY.

Recording a letter from the Director of Public Instruction submitting the report of Mr. Jones on his inspection of the -- at the Presidency College, Calcutta.

BACK PAPERS.

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Towards the close of last year, I applied for permission to proceed to Calcutta to inspect the physical laboratory at the Presidency College. My object was to see the provision made there for the wide range of the possible requirements of experimental work in Physics, with a view of embodying what I considered best & suitable in the new laboratory in the Presidency College Madras. Permission was granted, and I proceeded by the first available steamer, a little before the end of the term, in order to reach there, and finish my inspection before the College closed for the Christmas vacation. When I reached there, and during my stay, every facility was afforded me by the Principal, and the Professors of Physics, and Chemistry to inspect & make any measurements I wished in their respective laboratories. Of the Chemical laboratory, it is not my purpose here to speak. A full description of it has been drawn up & is now being printed, with drawings to scale of the working benches & fittings generally by Messrs. Wake

by Dr Pedler, the Professor of Chemistry - He has kindly promised to send me a copy of the printed account when ready, and this I shall forward as an addition to this report.

One of the difficulties in the way of providing elementary practical instruction in Physics to form a moderately sized class is the provision of apparatus. If all the students in a class are to work at the same lesson, or do the same piece of work at the same time, multiplication of apparatus of the same kind becomes necessary. This with an advanced class would mean great expense. In Chemistry, it is possible, and the system enables a teacher to give collective instruction & has other advantages from a didactic point of view. It is applicable in the earlier lessons in Physics also, when the students have never worked in a laboratory before, and consequently are entrusted to deal only with the cheapest & simplest apparatus, for some time. But it becomes necessary as a class advances to have each member of it working at a

different field of work; And with a little organisation it is possible to arrange the work so that no confusion occurs with a class of any size. In Calcutta, no attempt is made to conduct the practical classes on the first system, even at the beginning, and throughout the laboratory we find that each part is assigned, arranged & fitted for a particular kind of work. This is in my opinion a mistake - for beginners who have never worked in a laboratory before. For most of the elementary work, the collective system seems to be the best, and is the system adopted in Public Schools in England, where practical instruction in Physics is provided. A room where elementary practical work is carried on ought therefore to be fitted up to enable this system to be put into practice.

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The physical laboratory proper consists of five rooms occupying the whole of the ground flo[or] [illegible] tables are arranged [illegible]

the new Chemical Laboratories. The lecture rooms are conveniently enough on the other side of the College, on the first floor, entirely separated from the laboratory. There is nothing particularly meriting description in these rooms, & I shall only briefly refer to them later on.

For reference I number the rooms in the laboratory in the following way

No. 1. Technical Room
2. Elementary laboratory
3. 4. 5. } Advanced laboratory.

No. 1. This room is about 50 feet long, and 25 feet broad. One half of this room is found a workshop and is provided with a lathe, a carpenters bench. It is in charge of a skilled mechanic who is employed solely for the purpose of making any apparatus required in the laboratory. A strong table running across the room carries 30 storage cells. By means of cables current from these can be obtained in all the rooms, as well as in the lecture room & up the other hills. All the cables are carried through

with 5 H.P. steam engine that drives it, are housed
in a small room opening into this part.
I was given to understand that a Brotherhood
oil engine is to replace the steam engine
shortly. The other half of the room
contains almirahs for housing the apparatus
required in the next room, the Elementary
laboratory. There are two tables 4 feet
broad running across the room, each table
being provided with two gas jets, & at
one end, of a water tap & sink. The general
arrangements in this half are for observation
of phenomena at varying temperatures & pressures

No. 2. This is 48 feet long & 25 feet broad.
Eight tables each 2'6" wide & 8' long are arranged
along the middle of this room for electrical
& magnetical experiment chiefly. Over these
tables & about 10 feet above the floor run
two wires connected with the storage cells
for supplying current at any pressure up
to 60 volts. These tables are arranged [illegible]
ends. [illegible]

the walls. Balances are conveniently placed in several parts of the room. No apparatus is kept in this room; such as may be required being stored in room No. 1. About 36 students can work here together at a time.

No. 3. Size 25 feet square. In this room are facilities for the measurement of length & time with accuracy, and quantities involving these directly. A clock & Kater's pendulums with its stand are fixed up in this room. The room can be partially darkened for photometric working. These arrangements are not very good, but they sufficiently control the light for the purposes required apparently. A good deal of apparatus is kept in this room.

No. 4. Size 29 feet by 20 feet. Used chiefly for spectroscopic work, & optical work. The light is under control as in No. 3. Fitted with an optical bench, a number of tables carry spectroscopes for comparison work, & spectrometers for absolute determinations. In one part is built a 4'-1" table used for demonstrations. The room can be darkened by blinds. Walls

No. 5 of the same dimensions as No. 4. Used for Electrical measurements chiefly. Contains galvanometers of various kinds, and varying degrees of sensitiveness, - some of which are placed on stone tables - bridges, resistances, electrometer, Kelvin Crutch ampere balance, and an Edison phonograph. Here also the light is under control as in rooms No. 3 & 4.

Establishment. A skilled mechanic is employed solely to make & repair apparatus required for the Physical laboratory. His salary is Rs 40 rising to Rs 50 per month. Two peons are on duty in the laboratory, one in each lecture room.

The chief physical lecture room can hold about 150 students. Behind the lecturer's table is a space about 24' square used for storing apparatus. On either side of this space are two small rooms about 12' square, one of which is used as a photographic dark room. For optical

both physical & chemical, & all parts of the College, from a series of twenty two tanks placed on the roof of the building. Into these tanks water is pumped from the town main by one of Tangye's Compound Duplex Pumps.

Of the Chemical Laboratory, I will offer no details. The printed description of this will be forwarded as soon as received.

On comparing what I saw at the Presidency College, Calcutta with what exists at Madras, I would draw attention to the following points:

(1) the water Supply. All the Laboratories are supplied from the same tanks, & there is one pumping machinery. At the Presidency College, Madras, each Laboratory has its own tanks & pumping machinery of a very unsatisfactory kind.

Before seeing the water supply at Calcutta, I had drawn attention to the unsatisfactory state of our supply, & had suggested ... requirement practically ... deal with that at Calcutta.

P. Kl. Sam

(2) the electrical energy available from the Storage Cells at any part of the Laboratory, & the ready means of charging the cells. of the proposal to substitute a Priestman's oil Engine for the present Steam-Engine, I am unable to speak with any assurance. Oil engines still seem somewhat uncertain, & erratic in their behaviour notwithstanding the improvements recently effected in them. Seeing that gas is available, a gas engine would seem to be a more suitable substitute, if one is required.

(3) the Gas Supply. Mansfield gas is laid on in all the Laboratories. But this will shortly be available in Madras also I am given to understand.

R. Kl. Jones
Prof. of Physics

27th Feb. 1896.

When

CURRENT NO 434

OFFICE OF THE DIRECTOR OF
PUBLIC INSTRUCTION,
Madras, 24th March 1896.

No. 3634.

From

THE HONORABLE MR. D. DUNCAN, M.A., D.Sc.,
DIRECTOR OF PUBLIC INSTRUCTION,
Madras,

To

THE HONORABLE THE CHIEF SECRETARY TO GOVERNMENT,
FORT ST. GEORGE.

SIR,

With reference to G. O. No. 935, Educational, dated 16th December 1895, I have the honour to submit the enclosed report of Mr. Jones on his inspection of the Physical Laboratory at the Presidency College Calcutta. Mr. Jones is working out the arrangements of his new laboratory by the light of the experience he gained at Calcutta.

I have the honour to be,
Sir,
Your most obedient servant.

D Duncan

Director of Public Instruction.

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From

The Director of Public Instruction
Madras

H.H.

N° 241 d/ 12 April 96

Order
nil

Recorded.

To

The Hon'ble The Chief Secretary
to Government
of Fort St George

No. 3634

Dated 24th. March 1896.
Despatched 25th. Do

Enclosure 1

CHIEF SECRETARY
26 MAR. 189
GOVERNMENT OF MADRAS

The D.P.I. 940.

Dated 24/4/96

with remarks

Submitting the report of Mr
Jones on his inspection of the
Physical laboratory at the
Presidency College Calcutta.

When given for copying ____
When copied ____
When examined ____
When signed ____
} 189 .

READ AGAIN G.O., No. 189 , DATED

CURRENT No.

ENCLOSURES TO C. No

ORDER OF GOVERNMENT .. .. .. A A A A A A A

LETTER OF GOVERNMENT.

STATEMENT WITH DITTO.

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