

EDUCATION.

A

MAY.

File $\frac{2-D}{2}$

Nos. 11-38.

Deputation of Dr. J. C. Bose to Europe and his future position in the Education Department.

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DEPUTATION OF DR. J. C. BOSE TO EUROPE AND HIS FUTURE
POSITION IN THE EDUCATION DEPARTMENT.

[Nos. 11-12.]

[FILE $\frac{2-D}{2}$.]

No. 19885, dated Calcutta, the 28th November 1913.

From—THE HON'BLE MR. W. W. HORNELL, M.A. (OXON.), Director of Public Instruction, Bengal,

To—The Secretary to the Government of Bengal, General Department.

I HAVE the honour to report that Mr. J. C. Bose attains the age of 55 on 30th November 1913, and to ask for the orders of Government regarding the extension of his service.

2. Dr. Bose has expressed the desire that his service should be extended, and his physical fitness for further service is undoubted. There are however difficulties in the way of the extension of his service on its present conditions, which are referred to in the letter (of which a copy is annexed) from the Principal of the Presidency College.

3. By orders of Sir Edward Baker, communicated to this department unofficially in July 1909, the conditions on which Dr. Bose resumed his duties at the Presidency College after furlough were that he should lecture from 9 to 12 hours a week, on three days in the week, and be free to devote the remainder of his time to research work, the Physics Department retaining both the Professors who had carried on the work of that department during Dr. Bose's absence. It was implied that Dr. Bose should retain the position of Senior Professor of Physics.

4. This arrangement has not given entire satisfaction, and with the growing importance of the Physics Department of the College it is advisable that the control of that department should be in the hands of a man who is prepared to devote to it as a whole the time and energy which it certainly demands. Dr. Bose's research work has been, as the Principal points out, so absorbing as to be incompatible with the full discharge of the duties that a Principal naturally expects from the head of a department of the College under his control.

5. The Principal accordingly recommends that Dr. Bose's services should be extended, but that he should be allowed to devote himself entirely to research, and be relieved of the duties of Senior Professor in charge of the department. In view, however, of his long connexion with the College and of the distinction his researches have conferred upon it, he proposes that he should be given the honorific title of Emeritus Professor of the College.

6. I agree fully with the Principal's point of view. The proposal is in one sense in accord with the practice occasionally followed in England, where a distinguished teacher is sometimes rewarded after retirement with the honorary title of Emeritus Professor, the title carrying with it no official connexion with the institution and no share in its administration. It would, in my opinion, be a fitting reward of Dr. Bose's services if he were retained in Government service on extension, with the title proposed, but with no duties or responsibilities towards the Presidency College. Should he be desirous of continuing his researches within the College walls, he might have a small laboratory reserved for him with special apparatus and grants entirely under his control, but his Professorship should carry with it no responsibilities or privileges towards the rest of the College laboratory, which should be placed wholly under the control of the Senior Professor of Physics.

7. I should point out that Dr. Bose, though shown in the Civil List as drawing a personal allowance of Rs. 250, is actually in receipt of salary at the rate of Rs. 1,250 and no personal allowance, having, at the time of the re-organization of the service, chosen to accept the terms of the old graded service. He now draws the maximum pay of the second grade of that service, and as a consequence only two personal allowances of the second grade are available in West Bengal.

8. My proposals in sum are—

- (i) that Dr. Bose should be given an extension of service for one year from the 30th November 1913;
- (ii) that he should be relieved of all official connexion with, and responsibility for, the Presidency College and its laboratories;
- (iii) that he should be given the title of Emeritus Professor of the College; such title to be purely honorific;
- (iv) that should he wish to continue his researches at the Presidency College, definite and specific facilities as regards laboratory accommodation should be arranged for this purpose by the Principal.

9. I regret the delay which has taken place in putting this matter before Government, and would venture to ask that orders may be passed as soon as possible.

No. 1416, dated Calcutta, the 20th September 1913.

From—H. R. JAMES, Esq., M.A., Principal, Presidency College, Calcutta,
To—The Director of Public Instruction, Bengal.

WITH reference to your No. ¹²⁷⁹⁴_{2E-35}, dated the 8th August, I have the honour to say that I have ascertained that it is Dr. Bose's desire that his service should be extended, and there can be no question of his physical fitness. Dr. Bose's eminent distinction as a man of science and his achievements in the line of research which he has followed are also well known to Government.

2. I therefore recommend that an extension of service for one year be granted to Dr. Bose, but at the same time I think it would be more expedient if he were now set free by Government to devote his whole time and energies to his own research work and be relieved of the responsibilities at the present time devolving upon him as Senior Professor of Physics in this College. I make this latter recommendation in the interest of the Physics work at Presidency College as well as of Dr. Bose's own research work.

3. My reasons are these. The supervision of the actual teaching work in Physics at Presidency College, especially since the occupation of the new laboratories, is so onerous that it cannot be adequately met unless the Professor in charge of the department is prepared to give the greater part—practically the whole—of his time to it. This on his own showing Dr. Bose has never been prepared to do since his return from leave in July 1909; for he came back on a definite understanding that he should only be expected to give a limited portion of his time to his duties as Professor. He also stipulated that he was to be quite free for his own research work for three days in the week. I expressed at the time to Government the opinion that the arrangements proposed were contrary to the best interests of the laboratory, and I was able to obtain from Sir Edward Baker the concession that Dr. Harrison was retained in the College as "Supernumerary" Professor of Physics. This has worked fairly well, so long as there have really been three Professors of Physics, but it has not been possible to keep this arrangement continuously; and whenever, as at the present time, one of the two other Indian Educational Service Professors is away on leave or on deputation, the work suffers. Four years' experience as Principal since 1909 also confirms me in the opinion that in general it is not expedient to have a Professor on the staff of a College who claims on the strength of a definite compact to give so much work to the College and no more.

4. I am well aware of the distinction which Dr. Bose's name and reputation have brought to Presidency College where his research work was first begun. I think it would be a fitting recognition of his achievements and services if Dr. Bose's connection with the College were continued by appointing him Emeritus Professor in the College. But research work so absorbing as Dr. Bose's is not really compatible with the full active discharge of the exacting and onerous duties of Senior Professor in charge of the Physics Department.

5. Dr. Bose has himself recently addressed Government with a view to obtaining facilities for more extended investigations, and I have already had the opportunity of expressing the opinion that important results may be anticipated if the facilities he asks for are provided for Dr. Bose. If these facilities are granted to Dr. Bose, he might also be set free to devote himself entirely to research. If some such arrangement can be made, my recommendation holds good. But I cannot recommend an extension of service, except on the condition that Dr. Bose shall not remain at this College in charge of the Physics Department.

[No. 13.]

[FILE $\frac{2-D}{2}$.]

No. 5628, dated Calcutta, the 19th December 1913.

From—E. MILSOM, Esq., I.C.S., Offg. Under-Secretary to the Government of Bengal, General Department,
 To—The Director of Public Instruction, Bengal.

WITH reference to your letter No. 19885, dated the 28th November 1913, I am directed to convey the sanction of Government to the grant to Dr. J. C. Bose, Professor, Presidency College, of an extension of service for six months for the present with effect from the 30th November 1913, the date on which he attained the age of 55 years, pending further action to define Dr. Bose's future position, and on the understanding that he will be called upon to retire from service on any intermediate failure of capacity for work. The Accountant-General, Bengal, has been informed accordingly.

2. Government also accepts *ad interim* your proposal that Dr. Bose should be relieved of all official connexion with, and responsibility for, the Physics work of the Presidency College and its laboratories. Arrangements should however be made by the Principal to allow him the use of the laboratories, pending further orders, to enable him to continue his research work.

No. 5629.

COPY forwarded to the Accountant-General, Bengal, for information.

By order of the Governor in Council,

E. MILSOM,

Offg. Under-Secretary to the Govt. of Bengal.

CALCUTTA,

The 19th December 1913.

[No. 14.]

[FILE $\frac{2-D}{2}$.]

No. G.A.-2521, dated Calcutta, the 5th January 1914.

From—H. G. TOMKINS, Esq., C.I.E., Accountant-General, Bengal,
 To—The Secretary to the Government of Bengal, General Department.

WITH reference to Bengal Government, General Department, Education Branch, letter No. 5628, dated the 19th December 1913, I have the honour to enquire whether it is the intention of Government that, during the period of Dr. J. C. Bose's extension of service and from the date he is relieved of all official connection with the post of Professor of Physics in the Presidency College, he should still be held to retain the Professorship, internal arrangements being made for his lecturing, etc., and, if not, I would request the favour of information, as early as possible, as to the particular appointment he will hold, or whether he will be considered as on special duty during the period.

[No. 15.]

[FILE $\frac{2-D}{2}$.]

No. 598, dated Calcutta, the 5th February 1914.

From—THE HON'BLE MR. H. F. SAMMAN, I.C.S., Secretary to the Government of Bengal, General Department,
 To—The Secretary to the Government of India, Department of Education.

I AM directed to refer to the Secretary of State's Despatch No. 45 (Public), dated the 10th April 1908, copy of which was forwarded to this Government by the Government of India's endorsement No. 478, dated the 1st June 1908. In that despatch the Secretary of State accorded his sanction to Dr. J. C. Bose's being placed on deputation for one year to enable him to give demonstrations of the results of his scientific researches and to confer with other investigators in the same field, both in Europe and America.

2. Since the year 1908 Dr. Bose has made considerable progress in his researches. As a result, he has been invited to give a series of lectures before

scientific associations in Germany, and also at Oxford and the Royal Institution of Great Britain. To enable him to accept this invitation Dr. Bose has asked to be placed on deputation again for a period of nine months on the same terms as before.

3. Dr. Bose is engaged on work of an altogether exceptional nature. He is already drawing a scholarship of Rs. 2,000 a year and an annual subsidy of Rs. 2,500 for the prosecution of his scientific studies; and the Secretary of State has recently sanctioned the grant for a period of three years of a sum of Rs. 18,000 a year to place further facilities for research at his disposal. The Governor in Council considers it most desirable that Dr. Bose should be enabled to lay the result of his enquiries before the leading scientists in Europe, and is of opinion that it will add considerably to Dr. Bose's efficiency as an investigator if he is enabled at this stage to have a further conference with other investigators in the same field. A period of six months from the beginning of the long vacation (April to September) will however suffice for this purpose. I am accordingly to ask that the Secretary of State may be moved to sanction the deputation of Dr. Bose to Europe for a period of six months, from April to September 1914, on the same terms as in 1908, viz., that he should receive two-thirds of his salary while on deputation; the cost of first class fare from Calcutta to Bombay and back; the cost of first class passage from Bombay to London and back, with actual travelling expenses and subsistence allowance at the rate of 10s. 6d. a day during the period of his deputation.

4. I am to state, for the information of the Government of India, that Dr. Bose attained the age of 55 years on the 30th November 1913. An extension of service for six months was granted to him by this Government as a temporary measure pending receipt of the orders of the Secretary of State on the application for an additional grant for his research work. Now that sanction has been accorded to that proposal, it will clearly be necessary to extend the period of Dr. Bose's services for at least three years; but before passing orders to this effect the Governor in Council desires to decide the question of Dr. Bose's future status and to define his position with reference to the Presidency College, Calcutta. These questions are now under consideration and definite proposals will be submitted to the Government of India as soon as they have been decided. In the meanwhile, His Excellency in Council is unwilling to defer the matter of Dr. Bose's deputation, which is of some urgency, as it is essential that Dr. Bose should give as early an answer as possible to the invitation which he has received. For the present therefore His Excellency in Council has decided to grant Dr. Bose a further extension of service for six months to cover the period of his deputation.

[No. 16.]

[FILE $\frac{2-D}{2}$.]

No. 495, dated Delhi, the 20th March 1914.

From—THE HON'BLE MR. H. SHARP, C.I.E., Joint-Secretary to the Government of India, Department of Education,

To—The Secretary to the Government of Bengal, General Department.

WITH reference to your letter No. 598, dated the 5th February 1914, I am directed to state, for the information of the Governor in Council, that on the 6th March 1914 the Secretary of State was addressed in connection with the proposed deputation of Dr. J. C. Bose, C.S.I., C.I.E., to Europe.

[No. 17.]

[FILE $\frac{2-D}{2}$.]

No. 1607, dated Calcutta, the 4th April 1914.

From—THE HON'BLE MR. H. F. SAMMAN, I.C.S., Secretary to the Government of Bengal, General Department,

To—The Director of Public Instruction, Bengal.

I AM directed to refer to the correspondence resting with my letter No. 5628, dated the 19th December 1913, on the subject of Dr. J. C. Bose's extension of service and the arrangements to be made for the continuance of

his research work on the one hand and for the proper control of the Physics Department of the Presidency College on the other.

In your letter No. 19885, dated the 23th November 1913, you submitted the following proposals, viz. :—

- (i) that Dr. Bose should be given an extension of service for one year from 30th November 1913 ;
- (ii) that he should be relieved of all official connexion with, and responsibility for, the Presidency College and its laboratories ;
- (iii) that he should be given the title of Emeritus Professor of the Presidency College ; such title to be purely honorific ;
- (iv) that should he wish to continue his researches at the Presidency College, definite and specific facilities as regards laboratory accommodation should be arranged for this purpose by the Principal.

The acceptance of these proposals would have involved a reference to the Government of India, as the creation of a special post for Dr. J. C. Bose outside the ordinary scope of the department is beyond the power of this Government. To meet the immediate requirements of the case an extension of service for six months has been granted to Dr. Bose, who will continue to hold his present appointment pending further orders.

Since the receipt of your recommendations, an additional grant of Rs. 18,000 a year from Imperial and Provincial funds has, with the sanction of the Secretary of State, been made to Dr. Bose for three years in the first instance, with the object of affording him additional facilities for research. Sanction to this grant was communicated to you with my letter No. 1530, dated the 31st March 1914.

If these researches are to be conducted under the auspices of Government, it seems essential that Dr. Bose should remain in Government service. It seems also desirable that he should be attached in some way to the Presidency College in order that he may be enabled to make full use of the College laboratories. In view of the distinction that his researches have brought to the Presidency College, this arrangement would appear to be not unsuitable. If, however, he retains any connexion with the College, it is essential to define clearly what his status with reference to the College shall be, and to make such arrangements as shall not retard the development of the Physics Department. The Principal of the Presidency College has urged strong grounds against the continuance of Dr. Bose in his present position as head of the Physics Department, and Dr. Bose himself has suggested that a special post such as Director of Physico-Physiological Research should be created for him. This, however, would involve one of two things, viz., either the splitting up of the Physics Department into two branches—one for teaching and the other for research—or the creation of a department of Physico-Physiology as distinct from that of Physics. The former would have obvious disadvantages, one being that the Professor in charge of the Technical Branch would be debarred from full facilities for research. The latter would necessitate the issue of orders clearly defining the relationship between the two departments.

I am to request that you will now discuss the whole position with the Principal of the Presidency College, and consider whether your proposals in the matter should not be amended.

[No. 18]

[FILE $\frac{2-D}{2}$.]

No. 1608, dated Calcutta, the 4th April 1914.

From—THE HON'BLE MR. H. F. SAMMAN, I.C.S., Secretary to the Government of Bengal, General Department.

To—The Director of Public Instruction, Bengal.

In modification of paragraph 2 of Government order No. 5628, dated the 19th December 1913, I am directed to say that, upon further consideration, Government have decided that Dr. J. C. Bose, Professor, Presidency College, Calcutta, shall not for the present be relieved of his official connection with, and responsibility for, the Physics work of the College and its laboratories,

but that he shall continue, until further orders, to hold his appointment as Professor at the College.

2. The Accountant-General, Bengal, has been informed accordingly.

No. 1609.

COPY forwarded to the Accountant-General, Bengal, for information, with reference to his letter No. G.A. 2521, dated the 5th January 1914.

By order of the Governor in Council,

R. B. STEELE,

Under-Secretary to the Govt. of Bengal.

CALCUTTA,
The 4th April 1914.

[No. 19]

[FILE $\frac{2-D}{2}$.]

Telegram, dated the 16th April 1914.

From—Simla.

From—India, Education.

To—Darjeeling.

To—Bengal, General.

658 Edn. Your letter No. 598, dated the 5th February 1914. Secretary of State has sanctioned deputation of Dr. Bose to Europe for six months on same terms as in 1908.

[No. 19½.]

[FILE $\frac{2-D}{2}$.]

No. 72 T.—G.

COPY forwarded to the Director of Public Instruction, Bengal, for information.

By order of the Governor in Council,

R. B. STEELE,

Under-Secretary to the Govt. of Bengal.

DARJEELING;
GENL. DEPT.—Education,
The 20th April 1914.

[No. 20.]

[FILE $\frac{2-D}{2}$.]

No. 229 T.—G., dated Darjeeling, the 4th May 1914.

From—R. B. STEELE, Esq., I.C.S., Under-Secretary to the Government of Bengal, General Department,

To—The Director of Public Instruction, Bengal.

IN continuation of this department endorsement No. 72 T.—G., dated the 20th April 1914, I am directed to say that Government is pleased to sanction to Dr. J. C. Bose, Professor, Presidency College, who has been granted an extension of service for six months with effect from the 30th November 1913, in this department letter No. 5628, dated the 19th December 1913, a further extension of service up to the 2nd October 1914, to cover the period of his deputation to Europe.

No. 230 T.—G.

COPY forwarded to the Accountant-General, Bengal, for information, in continuation of this department endorsement No. 5629, dated the 19th December 1913.

By order of the Governor in Council,

R. B. STEELE,

Under-Secretary to the Govt. of Bengal.

DARJEELING,
The 4th May 1914.

[Nos. 21-23.]

[FILE $\frac{2-D}{2}$.]

No. 757, dated Simla, the 30th April 1914.

Endorsed by—The Government of India, Department of Education.

A copy of the following papers forwarded to the Government of Bengal for information, in continuation of this department telegram No. 656, dated the 15th April 1914.

No. 72, dated Delhi, the 6th March 1914.

From—His Excellency the Governor-General of India in Council,
To—His Majesty's Secretary of State for India.

WE have the honour to forward for your Lordship's consideration a copy of a letter from the Government of Bengal, No. 598, dated the 5th February 1914, in which they propose that Dr. J. C. Bose of the Indian Educational Service should be deputed to Europe for six months, from April to September 1914, in order to enable him to accept an invitation from certain scientific bodies to give a series of lectures on the result of his researches. It is suggested that the terms of deputation should be exactly the same as those granted to him on a similar occasion in Lord Morley's Despatch No. 45 (Public), dated the 10th April 1908.

2. The local Government have fully set forth the circumstances of the case. In the interest of science and with a view to encourage research by Indians, we commend the proposals to your Lordship for sanction as a special case, and as it is proposed that the deputation should commence from April next, we would request that your orders may be communicated to us by telegraph.

Telegram, dated the 8th April 1914.

From—London.

To—Delhi.

From—Secretary of State.

To—Viceroy.

YOUR Financial Despatch No. 72, dated the 6th March last. Bose. I sanction your proposal.

[No. 24.]

[FILE $\frac{2-D}{2}$.]

No. 396 T.—G.

COPY of the above forwarded to the Director of Public Instruction, Bengal, for information, in continuation of this department endorsement No. 72 T.—G., dated the 8th April 1914.

By order of the Governor in Council,

H. F. SAMMAN,

Secretary to the Govt. of Bengal.

DARJEELING ;

GENL. DEPT.—Education,

The 16th June 1914.

[No. 25.]

[FILE $\frac{2-D}{2}$.]

No. 389, dated Darjeeling, the 26th June 1914.

From—THE HON'BLE MR. W. W. HORNEILL, M.A. (OXON.), Director of Public Instruction, Bengal,

To—The Secretary to the Government of Bengal, General Department.

I HAVE the honour to invite reference to your letter No. 1607 T.—G., dated the 4th April 1914, on the subject of the extension of service to Dr. J. C. Bose, Senior Professor of Physics at the Presidency College, Calcutta.

2. Dr. Bose attained the age of 55 on 30th November 1913, and he was granted an extension of service for six months from that date (see Government letter No. 5628, dated the 19th November 1913); subsequently (see Government letter No. 229 T.—G., dated the 4th May 1914) he was granted a

further extension of service to the 2nd October 1914, to cover the period of his deputation to Europe. In your letter referred to in paragraph 1 above you ask me to consider, in consultation with the Principal, Presidency College, the whole question of the arrangements to be made for the continuance of Dr. Bose's research work on the one hand, and the proper organization and development of the Physics Department at Presidency College on the other.

3. Since your letter which is now under reply was issued, Dr. Bose has submitted to Government in a demi-official form certain proposals for the continuance and extension of his research work. I am asked to consider and advise Government with reference to these further proposals, but before examining them it would appear to be desirable to state clearly what assistance and encouragement towards his researches Dr. Bose has already received.

4. In 1896 Dr. Bose was placed on deputation and allowed to go to Europe for six months; this deputation was subsequently extended from six to nine months. In 1900 Dr. Bose was again allowed to proceed on deputation to Europe. On that occasion the deputation was first of all arranged for nine months, but the period was subsequently extended to 15 months. During his recent furlough Dr. Bose was for a third time placed on deputation for one year (see the despatch of the Secretary of State, No. 45 (Public), dated the 10th April 1908). During all these deputations Dr. Bose was liberally treated by Government: he was allowed to draw two-thirds of his salary, subsistence allowance, and first class passages from Calcutta to Bombay and Bombay to London and back, and travelling expenses to America. Dr. Bose has also been drawing since 1897 a contribution of Rs. 2,000 a year towards the cost of his more transcendental researches carried on in private and of his expenses in Europe. This Government (see General Department order No. 159 T.—G., dated the 1st June 1896) also gave in 1896 an annual subsidy of Rs. 2,500 for the prosecution of scientific researches at the Presidency College. This subsidy Dr. Bose has since drawn and devoted to the purposes of his research work, but it has now been amalgamated with the annual grant of Rs. 18,000 which was recently sanctioned. I am unable to ascertain whether it is the intention of Government that the total sum which Dr. Bose is now to receive from Government in support of his researches is Rs. 18,000 a year or Rs. 18,000 *plus* the contribution of Rs. 2,000 a year sanctioned in 1897.

5. The proposals referred to in paragraph 3 above may be summarized as follows:—

I. *Assistants*.—Dr. Bose proposes that his three assistants—Babu Surendra Chandra Das, Babu Guru Prasanna Das, and Babu Narendra Nath Sen—should all be taken into Government service on the following respective salaries, viz, Rs. 100 rising to Rs. 125 a month and Rs. 75 rising to Rs. 100 a month. He does not suggest by increments of what amount and at what periods available the progressive salaries advocated are to advance; but the salaries proposed amount, to start with, to Rs. 275 a month or Rs. 3,300 a year, and they will rise in accordance with the present proposals to Rs. 350 a month or Rs. 4,200 a year.

II. *Experimental gardens*.—Dr. Bose asks for three gardens—one in Calcutta itself, one in the suburbs of Calcutta, and a third in some hill station. As regards the garden in Calcutta, Dr. Bose explains that he has had to purchase some 35 cottahs of land, apparently in Circular Road. He observes that the rent of this land at the present rate would be Rs. 210 a month, and suggests that Government might pay him Rs. 200 a month in consideration of his use of the land for the purposes of his scientific researches. Dr. Bose does not propose to rent a garden in the suburbs of Calcutta, but suggests that one-half of the Inspection Bungalow at Sijberia might be reserved and adapted to his use. He also states that, in addition to going to Sijberia, he proposes to make frequent excursions into the country within 20 miles of Calcutta for collecting specimens, and suggests that in consideration of these journeys he should be allowed a fixed conveyance allowance of Rs. 1,200 a year. Dr. Bose does not state what the staff of these gardens will cost, but we may set down Rs. 1,500 a year as a conservative estimate under this head. For the experimental garden in the hill station Dr. Bose has not yet submitted

any definite suggestions. Presumably, if he considers it reasonable to ask for travelling allowance in connexion with his specimen-collecting expeditions in the neighbourhood of Calcutta, Dr. Bose will also expect Government to defray the cost of his journeys to the experimental garden in the hills. It may be assumed that the recurring expenses in connexion with the hill garden will amount at the very least to Rs. 1,500 a year, and this brings the recurring cost in connexion with experimental gardens up to Rs. 6,600 excluding rent for, or interest on the capital sunk in, the garden in the hills.

III. *Physico-Physiological Research Laboratory.*—Dr. Bose asks for a research laboratory, the construction and equipment of which will cost, he estimates, 4 lakhs. He also states that for the working expenses of the laboratory, including the pay of assistants—exclusive of the present assistants, who are to be provided with Government posts but to continue working for Dr. Bose (see under 5. I above)—will amount to Rs. 30,000 a year; and he suggests that the annual grant of Rs. 18,000 which he now receives should be raised to that amount. In other words, Dr. Bose now asks Government to incur in connexion with his research work capital expenditure of about 4 lakhs exclusive of the cost involved in the possible purchase of a garden in the hills, and recurring expenditure amounting to about Rs. 40,000 a year (viz., Rs. 3,300 for assistants in Government service, *plus* Rs. 30,000 for working expenses of the new laboratory, including the pay of assistants not in permanent Government service, *plus* about Rs. 6,600 for the recurring cost of the experimental gardens). I may add that the estimate of 4 lakhs covers apparently the cost of construction and equipment only. To this figure therefore there must presumably be added the cost of the purchase of a site in Calcutta.

6. Such roughly are Dr. Bose's proposals and their estimated cost. I am not in a position to evaluate Dr. Bose's work; but from the previous papers at my disposal I get the impression that two of my predecessors—Sir Alexander Pedler and Mr. Küchler—were both somewhat unwilling assentors to previous proposals to subsidize Dr. Bose's work even to the extent to which it has been subsidized since 1896. Sir Alexander Pedler and Mr. Küchler were both scientists, the former being a Fellow of the Royal Society.

7. The researches of Dr. Bose can be appraised only by a body of scientific experts such as the Royal Society or the Linnean Society. They are of an abstruse and exceptional kind, and I do not consider Government would be justified in incurring further expenditure on them. I may point out that the Presidency College is in need of some of the very elemental necessities of College existence, and that we have no funds from which these needs can be met. Not only so, but the funds now at the disposal of the Education Department—and I do not gather that anything but a small and gradual expansion of the Education budget is regarded as possible—are quite inadequate to meet the demands which the organization and the development of education require. In these circumstances it would, in my opinion, be inexpedient for Government to provide the amounts for which Dr. Bose has asked. Private endowment seems to me to be the proper source for the support of work of this kind. I have heard it suggested that it is necessary for Government to finance work of this kind, seeing that a scientist like Dr. Bose cannot look to that private liberality which in Europe and America would probably be forthcoming in support of work such as his. As against this contention I would cite the recent gifts of Sir Tarak Nath Palit and Dr. Rash Behari Ghosh. I can quite understand that there is little chance of his wealthy countrymen contributing towards the continuance and expansion of Dr. Bose's work, so long as they think that there is any chance of Government finding the money which is required. If it depended on them whether the work should go on or not, and they still declined to contribute, this attitude would make one a little sceptical as to the genuineness of the many protestations of enthusiasm for Dr. Bose's work which are always appearing in newspapers and elsewhere.

8. It would obviously be idle to build and equip a laboratory, unless at the same time permanent provisions were made for continuing it in use. Dr. Bose says that his assistants will doubtless carry on the work after his

death. On that point I personally entertain no doubt, provided that Government appointments are available for them; but seeing that the work is, I understand, of a peculiar and special nature, I do not see that it is by any means evident that there will always be persons able and willing to carry on the work in a way to justify the cost in the matter of building and equipment which it is now proposed to incur. This is an aspect of the question which does not seem to have been considered at all.

9. Again, Dr. Bose is already on an extension of service. If Government decide to build him the laboratory for which he has asked, the work of construction would probably take three or four years. I have not been able to form any idea as to the period over which it would, in the opinion of Government, be reasonable to continue to retain Dr. Bose in the Indian Educational Service. According to the recent grant of the Secretary of State, it seems that an extension for three years is implied *in the first instance*. Dr. Bose himself seems to expect extension of service till his death. He certainly does not appear even to have considered the possibility of his taking his pension and continuing his research work after retirement possibly with the help of a Government subsidy. This being so, it does not seem to me to be practical to discuss whether it would be justifiable for Government to sink a considerable sum of money in the construction of a laboratory for Dr. Bose's future work until they have decided how long they are prepared to retain his services. Article 459 (c) of the Civil Service Regulations lays down, with reference to the general procedure for extending an officer's service, that "in every case the extension should be given for not more than one year at a time." It was in accordance with this that I shaped the recommendations contained in my letter No. 19885 of the 28th November 1913. It is for Government to decide whether the abovementioned provision of the Civil Service Regulations is to be ignored in this case. Article 459 (d) enacts that an officer who has attained the age of 60 cannot remain in the service of Government, save in very exceptional circumstances; and, even if Government are prepared to decide now that Dr. Bose's services are to be retained till he is 60, this will not clear away all the difficulties, at least not if it is proposed to comply with Dr. Bose's most recent requests. If Government construct a laboratory for Dr. Bose and do for him all the other things for which he has asked, they will obviously not be in a position in five years' time to call upon him to retire, unless Dr. Bose definitely agrees now that after he has attained the age of 60 he will be content to take his pension and to carry on his researches in retirement.

10. Personally I should be happy to see Dr. Bose provided with adequate opportunities for his work, but there are two conditions with regard to the continuance and development of that work on which I, as Director of Public Instruction, feel it incumbent on me to insist:—

- (a) The first of these may be gathered from my previous remarks. If Dr. Bose is to receive any further assistance from public funds, the amount of money which is now available, or is likely within the next few years to be made available, for the ordinary work of the Education Department should not be curtailed in any way on this account. The amounts available for the ordinary work of the Education Department are at a minimum, and, apart entirely from the question of the desirability or otherwise of Government subsidizing scientific research, I should strongly resent these being affected in any way by expenditure such as that involved in Dr. Bose's recent proposals.
- (b) The second is that if Dr. Bose is to continue to prosecute his researches at the Presidency College, this should be on the basis of an arrangement which would safeguard the proper work of the institution from being adversely affected thereby.

11. I have discussed the latter question in its various aspects, and I find that both Mr. James and the Professors of Physics (Mr. Peake and Dr. Harrison) are quite willing to provide rooms for Dr. Bose's work, but that they hold that his connexion with the Physics Department must be definitely severed. I agree with this view, and desire to add that Dr. Bose should not, in the interests of the Physical Laboratory, be allowed to continue

to be the Senior Professor of Physics. I repeat the main reasons for this view :—

- (a) Dr. Bose as Senior Professor of Physics has final control of all the funds of the laboratory, namely :—

	Rs.
(i) The indent grant ...	... 3,250 per annum.
(ii) The laboratory research grant ...	... 500 "
(iii) The contingent grant ...	... 1,900 "

He controls the distribution of lectures and laboratory work among the junior staff. He has the exclusive use of the head mechanic and the carpenter on two whole days in the week, and the exclusive use of the junior mechanic on two other days.

- (b) Dr. Bose does not take an active part in teaching or guiding the experiments of the students. All the advanced teaching is done by others.
- (c) Dr. Bose spends on his private researches every year about £50 from the annual indent grant; he takes for his private researches about one-half of the laboratory research grant, and he spends a considerable proportion of the monthly contingent grant (which has to meet the current laboratory expenses) on items connected with his researches, the main item of expenditure being the workshop stores, which he requires for his own particular work.
- (d) Dr. Bose's recent developments have not been on the lines of physical science. His researches are all biological in character, as is exemplified by the facts that Dr. Bose is proceeding to Europe to lecture before the Botanical Society at Oxford, and that his recent paper in the Royal Society's Philosophical Transactions was published in Section B—a section devoted exclusively to biological science.
- (e) From the point of view of discipline, I regard it as most necessary to have Dr. Bose's connexion with the Physics Department discontinued. Everyone in the laboratory is fully aware of the present state of affairs, and knows that the titular head of the department exhibits no special care for its work, but is absorbed in the prosecution of his private researches, which are not researches into the problems of physical science. Such conditions render shirking and general slackness the more easy, while affording a ready excuse for neglect of duty.

12. Dr. Bose himself is quite willing to give up the position of Senior Professor of Physics, and the Principal of the Presidency College is quite ready to grant Dr. Bose, should he continue to work at the College, all reasonable facilities for his researches, which will include the use of rooms which will be reserved exclusively for his use and the supply of electric current. Mr. James, however, considers—and I agree—that, if Dr. Bose continues to conduct his researches at the Presidency College, the following stipulations must be clearly laid down and carefully adhered to :—

- (i) That Dr. Bose's work should be regarded as lying entirely outside the scope of the Physics Department, for the control, organization and development of which the Senior Professor of Physics will be, under the Principal, wholly responsible. This stipulation really includes all that is necessary, but certain specific points are enumerated below.
- (ii) That Dr. Bose should not have the right to require that work which he needs for his private researches should be carried out in the Physics Laboratory Workshop. Dr. Bose has already a workshop of his own in the College.
- (iii) That the grants available for the Physics Department, *i.e.*, the annual indent, the contingent and research grants, should be administered solely at the discretion of the Senior Professor of Physics, and that Dr. Bose should have no call whatever on these grants; he draws at present an annual grant from Government of Rs. 18,000.

- (iv) That the staff of assistants and menials assigned to the Physics Department should be under the exclusive control of the Senior Professor of Physics ; if it is considered desirable that any of the assistants or menials who are now assigned to the Physics Department should be employed in future in connection with Dr. Bose's work, this must be definitely arranged before the new régime is inaugurated, and any assistants or menials that it may be decided to assign to Dr. Bose should be regarded as definitely ascribed to him and not connected with the Physics Department.
- (v) That the Senior Professor of Physics should be definitely in charge of, and responsible to, the Principal for the consumption and use of all the stores and all the apparatus of the Physics Department.

13. To conclude, the position seems to be this. If Dr. Bose is to continue in the service of the Education Department for the purpose of prosecuting his researches, he will presumably have to continue, for some time at any rate, to work at the Presidency College. I have recorded my views with reference to Dr. Bose's proposals for the provision by Government of a separate laboratory and other extended facilities for his research. It is for Government to decide whether any of the further facilities for which Dr. Bose has asked should be provided, and, if so, under what sort of conditions as regards his service under Government Dr. Bose should make use of those facilities. Those facilities cannot, however, be made available for some years. For the present, seeing that it has been practically decided that Dr. Bose should continue in the service of Government, I recommend that a new post should be created for Dr. Bose under the title of Director of Physico-Physiological Research, and that this post should carry with it a salary of Rs. 1,500, the rate of pay which Dr. Bose will draw on his promotion to class I of the old graded Educational Service, which promotion is already due to him. I suggest further that Dr. Bose should be allowed to hold the post at the Presidency College under conditions which shall include the above stipulations, but which shall be worked out hereafter and in detail by the Principal of the College, and be submitted by him for the approval of Government.

14. In this connexion I desire to urge strongly that the post suggested immediately above, which must presumably be of a temporary nature, should be created for a period of not less than three years. Unless this is done, the retention of Dr. Bose in the Indian Educational Service and his appointment to a temporary post will result in a quite unjustifiable loss of promotion by other officers in the department, seeing that, unless it is possible to suspend in terms of article 89 of the Civil Service Regulations his lien on the Indian Educational Service post which he now holds, it will be impossible to promote, during his incumbency of the temporary post, one officer to a first grade personal allowance and another officer to a second grade personal allowance. I realize that the creation of the post above suggested will involve a reference to the Secretary of State, but the retention of Dr. Bose in the Indian Educational Service on the basis of his continued tenure of a post already included in the sanctioned cadre—and this is the only condition on which the Government of Bengal could settle the matter without reference to a higher authority—is, for the reasons which I have set forth in this letter, in my opinion quite impracticable.

[Nos. 26-28.]

[FILE $\frac{2-D}{2}$.]

No. 1573, dated Simla, the 14th October 1914.

Endorsed by—The Government of India, Department of Education.

A copy of the following papers forwarded to the Government of Bengal for information, with reference to the telegram from that Government, No. 2976, dated the 8th August 1914.

No. 164 (Public), dated India Office, London, the 11th September 1914.

From—His Majesty's Secretary of State for India,

To—His Excellency the Governor-General of India in Council.

WITH reference to the telegram of your Excellency's Government, dated the 13th August 1914, I enclose for your information copy of correspondence* from which it will be seen that I have sanctioned the extension of the period of deputation in Europe of Dr. C. J. Bose, C.S.I., C.I.E., of the Indian Educational Service, to such date in May as will admit of his arrival in India about the 15th June 1915.

* Extension of period of deputation of Dr. J. C. Bose, C.S.I., C.I.E.

* Letter to Dr. J. C. Bose, dated the 20th July 1914.

From Dr. J. C. Bose, dated the 22nd July 1914.

To Dr. J. C. Bose, dated the 5th September 1914.

[ENCLOSURE No. 1.]

No. J. and P. 2594.

INDIA OFFICE,
The 20th July 1914.

SIR,

In reply to your letter of the 8th instant I am directed to inform you that the Government of India are being consulted by telegram on the subject of the extension of the period of your deputation, and that on receipt of their reply a further communication will be addressed to you.

I am, however, to point out that it is not clear from your letter up to what date in May you desire your deputation to be extended, and to request that you will be good enough to state, with reason, the exact period of extension you consider desirable.

I am, etc.,
M. C. SUTTON.

To Dr. J. C. BOSE, C.S.I., C.I.E.

[ENCLOSURE No. 2.]

C/O MESSRS. HENRY S. KING,
9, PALL MALL, S. W.,
The 22nd July 1914.

DEAR SIR,

I am in receipt of your letter No. J. and P. 2594 of 20th July 1914.

In answer to your enquiries I beg to state that--

1. I desire to take part in the International Botanical Congress in London, the session of which lasts until about 15th May 1915. I could then reach India about 15th June 1915.
2. I have stated in my previous letter that--

(a) My proposed lecture before the Royal Society of Medicine takes place on 30th October 1914.

(b) The paper announcing an important new discovery of mine comes before the Royal Society about the end of November, and my presence at the ensuing discussion is regarded as highly desirable.

(c) From December 1914 to May 1915 I wish to carry out the following :--

- (1) A research of the effect of European climate on Plant Response
- (2) The construction under my personal supervision of some new instruments by means of special appliances available only in Europe. These instruments, it is expected, will render possible new lines of research for scientific workers.
- (3) The securing of other appliances which will be of importance in the laboratory.
- (4) To deliver the lectures which I am invited to give before the Continental and other Universities, and which cannot be given now on account of the summer vacation.

I have, etc.,
J. C. BOSE.

To the Under-Secretary of State for India.

[ENCLOSURE No. 3.]

No. J. and P. 3237.

INDIA OFFICE,
The 5th September 1914.

SIR,

With reference to your letter of the 22nd July last I am directed by the Secretary of State for India in Council to inform you that he sanctions the extension of the period of your deputation in Europe to such date in May as will admit of your arrival in India about the 15th June 1915. No further application for extension can be granted.

You should report in due course the steamer by which you would propose to sail.

I am, etc.,
T. W. HOLDERNESS.

To Dr. J. C. BOSE, C.S.I., C.I.E.

[Nos. 29-30.]

[FILE $\frac{2-D}{2}$.]

No. 7628 A., dated Calcutta, the 31st October 1914.

Memo. by—A. CASSELLS, Esq., Under-Secy. to the Govt. of Bengal, Appt. Dept.

EXTRACT forwarded to the General Department of this Government for information.

No. 1093 C.S.R., dated Simla, the 22nd October 1914.

Endorsed by—The Government of India, Finance Department.

COPY of the following forwarded to the Government of Bengal, Appointment Department, for information.

The undermentioned officers have been granted by His Majesty's Secretary of State for India extension of leave or permission to return to duty, as advised in list dated the 24th September 1914:—

Extension of leave.

Name.	Service.	Appointment.	Date of expiry of leave previously granted.	Period and nature of extension.	Advised to India by telegram dated—
Bose, Dr. J. C., C.S.I., C.I.E.	...	Professor, Presidency College, Calcutta.	1st October 1914	Deputation extended to such date in May as will admit of his arrival in India about 15th June 1915.	.
.

Permitted to return.

Nil.

[No. 31.]

[FILE $\frac{2-D}{2}$.]

No. 4954.

COPY of letter (1) from Government of India, Department of Education, No. 1573, dated the 14th October 1914, and enclosure, (2) memorandum from the Appointment Department of this Government, No. 7628 A., dated the 31st October 1914, forwarded to the Director of Public Instruction, Bengal, for information.

By order of the Governor in Council,

R. B. STEELE,

Under-Secretary to the Govt. of Bengal.

CALCUTTA;

GENL. DEPT.—Education,
The 23rd December 1914.

[No. 32.] GENERAL DEPARTMENT. [FILE $\frac{2-D}{2}$.]

EDUCATION—No. 338.

CALCUTTA, THE 21ST JANUARY 1915.

FROM THE HON'BLE MR. H. F. SAMMAN, I.C.S.,

Secretary to the Government of Bengal,

TO THE JOINT SECRETARY TO THE GOVERNMENT OF INDIA,

DEPARTMENT OF EDUCATION.

SIR,

I AM directed to invite a reference to paragraph 4 of my letter No. 598, dated the 5th February 1914, in which the Government of India were informed that an extension of service had been granted to Dr. J. C. Bose, Senior Professor of Physics at the Presidency College, Calcutta, to cover the period of his proposed deputation to England, and that orders regarding a further extension had been held over till the question of his future status and his position with reference to the Presidency College, Calcutta, had been fully considered. Since then Dr. Bose's deputation has been sanctioned and the period of it has been extended up to May 1915, an extension of his service being granted at the same time up to the date of the termination of his deputation.

2. The Director of Public Instruction, who has been consulted regarding the future status of Dr. Bose and his position with reference to the Presidency College, reports that Dr. Bose, though nominally Senior Professor of Physics, has been unable to take any active part recently either in teaching or in the administration of the Physics Department, his time and energies being devoted almost entirely to his special researches and experiments, which are in their nature biological rather than physical, and that this absorption in his research work has proved prejudicial to the department which he is supposed to control. In these circumstances, the Hon'ble Mr. Hornell, in agreement with the Principal of the Presidency College, lays emphasis upon the importance of freeing Dr. Bose for his special work by relieving him of his duties as Senior Professor of Physics and thus severing his connection with all teaching work in the College. These officers are at the same time quite willing that Dr. Bose should be permitted to continue his research work in the laboratories at the Presidency College, a set of rooms being placed at his exclusive disposal, with a supply of electric current. Should this change be sanctioned another officer would be appointed Senior Professor of Physics and would be given entire responsibility for the control, organization and development of the department, with full power to administer the grants, exclusive control over the staff and sole charge of the stores and apparatus. The Director of Public Instruction suggests at the same time that a special temporary post should be created for Dr. Bose on Rs. 1,500 a month, the pay of an officer in class I of the old graded Educational Service, and he asks that the period of this appointment may be fixed at not less than three years, so that it may be possible to second Dr. Bose in the Indian Educational Service.

3. The Governor in Council, while accepting the proposal that Dr. Bose should be permitted to continue his researches at the Presidency College, adequate laboratory and workshop accommodation being set apart for his

exclusive use, agrees with the Director of Public Instruction as to the desirability of withdrawing Dr. Bose from the Physics Department of the College and appointing him to a special research post. This step is required not only in the interests of the Physics Department, but also in the interests of Dr. Bose himself, who will then be free to devote his entire energies to his scientific investigations. His Excellency in Council is however of opinion that difficulties are likely to arise in connection with the proposal to second Dr. Bose, and he is anxious to avoid the block in promotion in the Indian Educational Service which would be caused by the indefinite extension of this officer's service. He would accordingly prefer greatly an arrangement by which Dr. Bose would retire from the service on his return from deputation in May next, a temporary post being created for him, for a period of five years from the date of his retirement, on such pay as will, with his pension, bring his total emoluments up to Rs. 1,500 a month.

4. Before leaving for England in April last Dr. Bose requested that the grant for the furtherance of his research work, sanction to which was conveyed in Mr. Sharp's letter No. 165 Edn., dated the 26th January 1914, might be increased from Rs. 18,000 to Rs. 30,000 a year; that a laboratory might be constructed and equipped by Government at a cost of Rs. 4,00,000 for his exclusive use; that he might be granted the use of a bungalow at Sijbaria for garden experiments; and that three of his assistants might be provided with posts in the service of Government. A copy of Dr. Bose's note is appended for the information of the Government of India.

5. The Governor in Council has given these demands his most careful consideration. He recognises the high value of Dr. Bose's work and is of opinion that it fully deserves the support of Government. In view however of Dr. Bose's advanced age and the doubt whether, now that his work has been more fully developed and will be followed up by scientists elsewhere, it will be continued on the same lines at the Presidency College for many years longer, the Governor in Council does not wish to press the proposal for the construction of a special research laboratory and is of opinion that the facilities that will be given to him, under the arrangements proposed above, for working in the laboratories of the Presidency College, will prove sufficient. This decision will also affect the request made by Dr. Bose for an increase in the grant recently sanctioned, which request is based almost entirely on the assumption that he will in future work in a special laboratory equipped on a somewhat extravagant scale. If this laboratory be not built some of the expenditure anticipated by Dr. Bose will be saved, although he will still have to meet considerable extra expenditure in connection with the maintenance of his separate laboratory and a separate workshop. In these circumstances, an increase of his existing grant from Rs. 18,000 to Rs. 24,000 will probably suffice, together with an initial grant of about Rs. 25,000 for the improvement of the equipment at present in use and for the establishment of a separate workshop. As the grant of Rs. 18,000 has been sanctioned for a period of three years only in the first instance, its continuance would be required to enable Dr. Bose effectively to carry out his researches throughout the term of the proposed temporary appointment.

6. As to the remaining requests made by Dr. Bose, the Governor in Council is willing to place at his disposal a plot of land at Sijbaria, or elsewhere in the vicinity of Calcutta, and also a small piece of garden in the hills. His Excellency in Council also accepts Dr. Bose's proposal that three of his assistants should be provided with Government posts, and is willing to appoint Babu Surendra Chandra Das and Babu Narendra Nath Sen substantively, and Babu Guruprasanna Das *sub. pro tem.*, to the Subordinate Educational Service in grades V, VI and IV, respectively, and then to depute them for five years to work under Dr. Bose, giving them the same pay and promotion as would fall to their share if they were working in the general line.

7. As Dr. Bose's researches do not come within the ordinary work of administration, the creation of a temporary appointment for him and the deputation of three assistants in Government service to work under him will require the sanction of the Secretary of State. I am desirous to commend these proposals to the favourable consideration of the Government of India, but to point out that, as the resources of the Education Department in Bengal are

wholly inadequate to meet even the most pressing demands of the present day, the Government of Bengal are unable to make any contribution towards the expenditure which would be involved. At the same time the claims of Dr. Bose to assistance from the State are unquestionable. He is the foremost among the few Indian scientists who have distinguished themselves in the paths of original research; his work is not provincial or local, for the success of his researches brings honour to all Indians and not only to those in Bengal, while his work is described by competent authorities as being of world-wide value and importance. In view of these considerations the Governor in

Annual contribution to Dr. Bose's pay, exclusive of his pension at Rs. 6,000 a year	...	Rs. 13,000
Pay of three research assistants on Rs. 75, Rs. 100 and Rs. 125	...	3,600
Additional grant for research	...	6,000
Total	...	<u>22,600</u>

Council trusts that the Government of India will be prepared to meet out of Imperial revenues the small additional charge, amounting to Rs. 25,000, for initial expenditure and the additional research grant together with the pay of Dr. Bose and his assistants, amounting to Rs. 22,600 a year, as shown in the margin, for a period of five years; and

that the Governor-General in Council will be pleased to move the Secretary of State to sanction these proposals and the continuance of the annual grant of Rs. 18,000 up to the termination of the proposed temporary appointment.

I have the honour to be,

SIR,

Your most obedient servant,

H. F. SAMMAN,

Secretary to the Government of Bengal.

[No. 33.]

[FILE $\frac{2-D}{2}$.]

No. 1006, dated Calcutta, the 25th February 1915.

From—R. B. STEELE, Esq., I.C.S., Under-Secy. to the Govt. of Bengal, Genl. Dept.,
 To—The Director of Public Instruction, Bengal.

IN continuation of this department letter No. 229 T.—G., dated the 4th May 1914, I am directed to convey the sanction of Government to the grant to Dr. J. C. Bose, Professor, Presidency College, of a further extension of service up to the 15th June 1915.

2. The Accountant-General, Bengal, has been informed.

No. 1007.

COPY forwarded to the Accountant-General, Bengal, for information.

By order of the Governor in Council,

R. B. STEELE,

Under-Secretary to the Govt. of Bengal.

CALCUTTA;

The 25th February 1915.

[Nos. 34-37.]

[FILE $\frac{2-D}{2}$.]

No. J. and P. 669, dated India Office, London, the 3rd March 1915.

From—The Secretary, Judicial and Public Department,
 To—The Chief Secretary to the Government of Bengal.

I FORWARD, for information, a copy of the papers noted in the margin

on the subject of Dr. J. C. Bose's researches. A copy has also been
 sent to the Government of India.

From Dr. J. C. Bose to Sir Thomas Holderness,
 dated the 4th February 1915.

To Dr. Bose, dated the 25th February 1915.

C/o MESSRS. THOMAS COOK & SONS,

245, BROADWAY NEW YORK.

CHICAGO,

The 4th February 1915.

DEAR SIR THOMAS,

I am very glad to inform you that my scientific deputation here has proved to be a great success. They regard my methods to be of highest importance in practical and theoretical sciences. At Washington, the Bureau of Plant Industry and the Academy of Sciences organized a large meeting for my lecture. They say that since the establishment of the Academy, they never had another lecture of equal importance. The amount annually spent by the Bureau is 23 million dollars for the improvement of plant industry, and it is a matter of much satisfaction to me that they thought my work would materially advance agriculture.

I was specially invited to give a lecture at the State Department of Washington before the Secretary of State and the members of the Government. They not only expressed high appreciation of the scientific results, but also much gratification at the courtesy shown by the Governments of India and of Great Britain in deputing one of their officers to this country for the advancement of science.

The Columbia University have asked me whether they could send their post-graduate scholars in plant physiology to be trained under me in Calcutta; they would prefer this to sending them to Germany. This recognition of the importance of work done under the auspices of the Government of India is a matter of much gratification to me.

In my memorial to the Secretary of State I prayed for the sanction of a research laboratory, equipped with best mechanical appliances and special instruments essentially necessary for further progress of work. These last would cost about (£ 4,000. Since I am now on the spot, I would not have a better opportunity for ordering these either in America or in England to suit special requirements. I shall be very grateful to you if you could help me in this matter by recommending it for the sanction of the Secretary of State.

I have been asked to lecture before the University of California. When I am on the Pacific coast, perhaps it may be easier for me to reach India by the Western route. Have I your permission to travel that way should circumstances make that route preferable? I shall undertake to reach India before 15th June, the date of expiration of my period of deputation.

I remain, etc.,

J. C. BOSE.

TO SIR THOMAS HOLDERNESS.

SHOWS PLANTS' EMOTIONS.

INDIAN SCIENTIST EXPOUNDS HIS THEORIES BEFORE SECRETARY BRYAN.

Special to the New York Times.

WASHINGTON,

The 15th January 1915.

In the Diplomatic Reception Room of the State Department this afternoon Dr. J. C. Bose, a native of India, who is Professor of Physics in the Presidency College in Calcutta, performed before Secretary Bryan and a group of State Department officials experiments which, he said, showed that plants had sensitiveness and feelings just like human beings. The experiments were conducted with living plants, but the Secretary of State showed the greatest interest when Dr. Bose produced a chart that indicated in wavering lines the effect of alcohol on plant life.

By means of a delicate and complicated instrument Dr. Bose made plants record the emotions they experienced as the result of his actions. He explained that if a man was pinched on the wrist a certain shock was communicated to the brain. To demonstrate the same principle with reference to a plant he pinched one of the growing things that he had brought with him, and immediately a fine needle attached to a lever connected with the plant became agitated and exhibited his emotion by making dots on the smoked side of a plate of glass. Dr. Bose put the plant to death by giving it a dose of cyanide of potassium, and Secretary Bryan and the others watched the death struggle with bated breath.

No J. and P. 669 (Public).

INDIA OFFICE, LONDON,

The 25th February 1915.

SIR,

With reference to your letter to Sir Thomas Holderness, dated the 4th February, I am directed by the Secretary of State for India in Council to state that the memorial referred to therein is under consideration by the Government of Bengal who have not yet made any recommendations to the Secretary of State with regard to it.

The request made in your letter for permission to order, either in England or in America, instruments costing about £4,000 should also be addressed to the Government of Bengal.

There is no objection to your returning to India by the Western route if you prefer to do so.

I am, Sir,

Your obedient servant,

M. C. SETON.

TO DR. J. C. BOSE, C.S.I., C.I.E.,

C/o MESSRS. THOMAS COOK & SON, 245, Broadway, New York.

[No. 38.]

[FILE $\frac{2-D}{2}$.]

No. 733, dated Simla, the 16th April 1915.

From—THE HON'BLE MR. L. C. PORTER, C.I.E., I.C.S., Secretary to the Government of India, Department of Education,

To—The Secretary to the Government of Bengal, General Department.

I AM directed to refer to your letter No. 338, dated the 21st January 1915, and to state, for the information of the Governor in Council, that before considering the proposals submitted therein, the Government of India have deemed it advisable to obtain the advice of the Royal Society regarding the value, both abstract and practical, of Dr. Bose's research work. With this object they addressed the Secretary of State on the 8th April 1915. A further communication will be made to the Government of Bengal in due course.

B. S. P. 258-2-8-1915-1323C, 3290C & 3057C-58-H. S. D.

GENERAL DEPARTMENT.

EDUCATION.

[FILE $\frac{2-D}{2}$.]

K.-W.—A PROCEEDINGS FOR MAY 1915, Nos. 11-38.

Deputation of Dr. J. C. Bose to Europe and his future position in the Education Department.

[Nos. 11-12.] From the Director of Public Instruction, Bengal, No. 19885, dated the 28th November 1913.

ATTENTION is solicited to Sir Edward Baker's orders, dated the 23rd July 1909, and the notes which follow (Education B Proceedings for September 1909, Nos. 203-204). We addressed the Government of India last July on the subject of the grant to Dr. Bose of further facilities for research.

S. K. B.—6-12-1913.

S. N. G.—6-12-1913.

I do not quite understand the position. Dr. Bose attained the age of 55 years last month. Had he applied for any extension of service before that date? If not, did he not cease to be in Government service on November 30th? Is not an application from Dr. Bose necessary?

H. F. SAMMAN—7-12-1913.

THE Director of Public Instruction recommends one year's extension of service to Dr. J. C. Bose as a reward for his distinguished research work, but proposes to relieve him of all responsibilities and privileges connected with his post as senior Professor of Physics. The idea is that he should be free to devote himself entirely to research work and that special arrangements regarding the laboratory should be made for this. A further proposal is that Dr. Bose should be given the honorific title of Emeritus Professor.

Dr. Bose attained the age of 55 years on November 30th last, so immediate orders are required on the first point.

The Director of Public Instruction's proposals are based on those of Mr. James, whose recommendation for an extension of service is conditional on arrangements being made to relieve Dr. Bose of charge of the Physics Department.

The proposal is one on which the Financial Department will have to be consulted before it can be sanctioned, but a reference to that department is, I think, unnecessary before it has been decided to support it on its merits.

The proposal has not been worked out very fully, but I understand that, if it be accepted, the same staff of officers will be required as if Dr. Bose retired—seeing that Dr. Bose will do no work at all as a Professor. The weakest point in the proposal is that the research work on which Dr. Bose will be engaged is not work for Government, but, as Mr. James puts it, "his own research work." I doubt whether the grant of full pay to an officer who does no work for Government would be justified. Nor do I see what necessity there is for it. If Dr. Bose retires in the usual way he will get his pension, which should suffice for a scientist who devotes his whole time to research work. If, however, it be not considered sufficient, or if it be the intention of Government to grant Dr. Bose a further reward for his work, the addition to his emoluments might take the form of an enhanced pension or even a special life-annuity.

So long as Dr. Bose remains on active service, I take it that one member of the educational service will be deprived of the personal allowance of the second grade. It seems to me unfair to deprive the working members of the service of one of these allowances in order to reward an officer who has ceased active work as a servant of Government.

If Dr. Bose is to be relieved of all work for Government, it is probable that the Secretary of State's orders will be required; but this is a point on which Financial can advise. If it is required, I think that it will be necessary to establish the necessity for the extra emoluments and that the chance of success would be greater if these were to be additions, in some form or other, to pension.

The question of giving Dr. Bose the title of Emeritus Professor is distinct, and requires further examination; but I do not delay the file for this, as the question of extension of Dr. Bose's service is of extreme urgency.

H. F. SAMMAN—8-12-1913.

We have already explained to India the reasons why we attach the greatest importance to the researches of Dr. Bose; and I do not think we should take the line that these researches are not "Government work" but private work.

At the same time the position of Dr. Bose, if he devotes his whole time to research and takes no part in actual teaching work, will undoubtedly be anomalous and requires consideration.

I am inclined to the view that he should be definitely taken off the sanctioned strength of the college, and that the 2nd grade allowance which is kept vacant while he is in active service should be filled up. But I think he should continue to draw full pay, on extension of service, while he is engaged upon his present researches.

But we do not know as yet what scheme for the payment of the cost of these researches has been recommended by India to the Secretary of State, or what the Secretary of State will sanction.

We should sanction the extension of service for six months for the present, pending further action to define Dr. Bose's future position, and we may accept, *ad interim*, the proposal that he should be relieved of all official connection with, and responsibility for, the Physics work of the Presidency College and its laboratories.

Arrangements should be made by the Principal to allow Dr. Bose the use of the laboratories, pending the receipt of the orders of the Secretary of State on our recent recommendations.

His Excellency should see.

Financial must, perhaps, be consulted as to these temporary arrangements before orders issue.

P. C. LYON—9-12-1913.

LET Financial see before the case goes to His Excellency.

H. F. SAMMAN—9-12-1913.

THE arrangement proposed means either the creation of two appointments for the same work which is forbidden or the creation of an extra post. This the local Government can do for six months, but as the extension is to be for a year, I do not think that this Government can do anything without the sanction of the Government of India.

S. K. SAWDAY—11-12-1913.

DR. BOSE I take it is in the Indian Educational Service. What exactly is the arrangement proposed for his work; does it involve the appointment of another Professor of the Indian Educational Service; if so it apparently means an addition to the cadre?

H. L. STEPHENSON—11-12-1913.

WE had better ask Director of Public Instruction to state definitely what arrangements he proposes.

E. MILSOM—13-12-1913.

YES, will an addition to the cadre be necessary for these six months?

I have just spoken to Director of Public Instruction, about this. He is just leaving for Serampore. Director of Public Instruction thinks no addition to the cadre will be necessary but wishes his office to verify.

Please ascertain from Director of Public Instruction's office.

H. F. SAMMAN—13-12-1913.

THE normal strength of the Indian Educational Service staff for the Physics Department of the Presidency College is two. The staff has been three strong under the special sanction of Government since Dr. Bose returned from furlough, the reason being that Dr. Bose did not perform the full share of a Professor's work. When Dr. Bose's connection with the college-teaching ceases, there will be no real objection to the number of Indian Educational Service professors being reduced to two. It is therefore not immediately necessary to appoint a successor to Dr. Bose in the Indian Educational Service cadre.

S. N. S.—13-12-1913.

DIRECTOR OF PUBLIC INSTRUCTION's office note submitted.

S. N. G.—13-12-1913.

E. MILSOM—13-12-1913.

CONSULT Financial again now. No addition to the cadre is required at present. The present proposal is for six months' extension only—not for a year.

H. F. SAMMAN—13-12-1913.

DIRECTOR OF PUBLIC INSTRUCTION's letter says the extension is for a year but presumably he has changed his opinions.

S. K. SAWDAY—15-12-1913.

ON the understanding that this does not involve any addition to the Presidency College staff there is no objection to the extension of Dr. Bose's service by six months; nor as a purely departmental and temporary arrangement to his being relieved of the duty of lecturing.

But if it is proposed that Dr. Bose shall be kept on specifically and as a permanent arrangement to undertake research work, the proposals requires the sanction of the Government of India and probably the Secretary of State as this is not the recognised duty of the Indian Educational Service.

H. L. STEPHENSON—15-12-1913.

FINANCIAL SECRETARY's opinion above is satisfactory and we may sanction the proposal on these lines.

Director of Public Instruction should see the latter part of Financial Secretary's note, but it does not appear that it is intended to keep Dr. Bose on permanently; if it is, we ought to have definite proposals very early, so as to get things through before the expiry of the six months now given.

E. MILSOM—15-12-1913.

TAKEN up to His Excellency who approves the proposals in Hon'ble Member's note of 9th December 1913.

Issue orders and then take further action.

H. F. SAMMAN—16-12-1913.

[No. 13.]

O. I. Nos. 5628-29, dated the 19th December 1913.

DRAFT for approval. We need not perhaps say at the moment as in first paragraph of Financial Secretary's note, dated the 15th December 1913, and the point may be considered later.

(After issue, this may go to Director of Public Instruction for such further action as he may propose to take).

S. K. B.—18-12-1913.

S. N. G.—18 12-1913.

E. MILSOM—19-12-1913.

I THINK that we had better discuss this before we proceed further. There seems to be so many difficult proposals in the field. I understand from Dr. J. C. Bose that he now wants to be sent to England on deputation, and that His Excellency has told him that he will support this proposal, but surely we cannot consider the deputation until the question of the extension has been settled.

W. W. HORNELL—18-1-1914.

[No. 14.] From the Accountant-General, Bengal, No. G.A. 2521, dated the 5th January 1914.

CALCUTTA,
The 9th January 1914.

DEAR SIR,

I have from time to time reported to you the progress of my researches carried out at the Presidency College. My researches on "The Irritability of Plants" published last April had the good fortune of rousing much scientific interest in Europe. As a result of this, I have been invited to give a series of lectures before scientific associations in Germany. In England also, I have been asked among other places, to lecture at Oxford and at the Royal Institution of Great Britain.

The Government has been pleased to take an active interest in my researches, and have on several occasions, sent me on scientific deputation to Europe and America, to lay the results of my work carried out under its auspices, before the scientific world. Some of the phenomena that I have very recently discovered, promise to be of great significance in several branches of science. Under these circumstances, may I ask the Government to send me once more to Europe on scientific deputation for a period of nine months on the same terms as before?

I may add that my visit to Europe will also enable me to obtain the various machineries required for the perfection of the highly sensitive apparatus invented by me.

I remain,

Yours truly,

J. C. BOSE.

TO THE HON'BLE MR. P. C. LYON, C.S.I., I.C.S.,
Member, Bengal Executive Council.

CALCUTTA,
The 13th January 1914.

DEAR MR. LYON,

The programme of the Royal Institution is settled several months in advance. I, therefore, wrote to Lord Rayleigh enquiring whether my recent work would be regarded of sufficient importance to justify the managers of the Royal Institution to invite me to lecture, in the probable contingency of my being in England this summer. I enclose the letter from the Secretary, as also the letter from the Botanical Department, Oxford.

In this and in other matters, I wished to lay before you things which would help me in my work, leaving it to you to decide how far they were practicable.

I am afraid I did not make one point quite clear. Several lines of work which I intended to take up might have appeared as somewhat unrelated. In reality, it is not so. The principal objects of my investigation are the fundamental reactions of living organisms, both plant and animal, through skin, through muscle, through nervous and digestive mechanisms, and through the various devices of defence and offence. It is true that the programme is very large, but it is not absolutely beyond the work of a lifetime, provided that one was not floundering in wrong tracks.

You will let me thank you sincerely for the grant you have secured for my research. This could not possibly have been secured without your active support.

Yours sincerely,

J. C. BOSE.

TO THE HON'BLE MR. P. C. LYON, C.S.I., I.C.S.,
Member of the Bengal Executive Council.

LONDON,
The 24th November 1913.

DEAR SIR,

Lord Rayleigh has sent on the letter you addressed to him about a lecture or lectures at the Royal Institution in the summer of next year. There would be no difficulty in regard to dates for a course of day lectures during your visit to this country. I could offer you either Tuesdays, May 19th and 26th or Tuesdays, June 2nd and 9th. If, however, you prefer to give a Friday evening discourse instead of day lectures, then the decision would require to be delayed for the consideration of the managers in February or the beginning of March next, which might be too late. I shall be glad to hear from you in the matter at your earliest convenience.

Yours truly,

ALEX. SIEMENS.

TO PROFESSOR J. C. BOSE, C.I.E., M.A., D.Sc.,
Presidency College, Calcutta.

OXFORD,
The 24th December 1913.

DEAR PROFESSOR BOSE,

In view of your promised visit to England this next spring, I am writing to ask you to be so kind as to give a lecture in the Botanical Department here, if you can arrange it, on the subject of your electrical researches on plants and plant movements. There are, I know, a good many scientists here who are interested in your work, and who would welcome the opportunity of hearing your exposition of it, and of seeing the ingenious apparatus that you have devised to carry out your investigations.

Yours very faithfully,

S. H. VINES.

To PROFESSOR J. C. BOSE, C.I.E., M.A., D.SC.,

Presidency College, Calcutta. •

QUESTION OF DR. J. C. BOSE'S FUTURE SERVICE.

Pay.—The following facts may be noted :—

Mr. James, 5 years' junior, pay Rs. 1,250 + 400 = 1,650.

„ Peake, 11 years' junior, pay Rs. 1,000 + 100 + 400 = 1,500.

Dr. J. C. Bose, pay Rs. 1,250.

Designation.—Director of Physico-physiological research?

Period.—The above appointment may be created and held as long as Dr. Bose is physically fit for work.

The research allowance sanctioned by the Secretary of State is to be continued for the same period.

Duties.—Special training to be given to research students at the Presidency College and at the movable research stations.

Also to deliver a series of at least six post graduate lectures in Calcutta of the standard of the lectures at the Royal Institution.

Facilities for work.—The Government fully recognising the importance of research at the Presidency College in the cause of education, desires to offer every facility for its prosecution. Dr. Bose will, therefore, have as full an use of the laboratory and the workshop for research as he had hitherto enjoyed. In this respect he will enjoy the same privilege as the senior professor.

ABOUT THE GRANT.

1. The new grant made by the Secretary of State will be in addition to the two grants hitherto made to Dr. Bose.

2. Two research scholar assistants to be continued as before.

3. The grant to be utilised for the laying out and upkeep of experimental gardens in Calcutta and outside, materials for the same, construction of apparatus, pay of assistants and mechanics, conveyance and travelling allowance for self and assistants. All these items should not exceed the total amount of grant.

4. Accounts to be periodically submitted to the Accountant-General.

5. Purchase of books by Government on Dr. Bose's researches.

PLEASE see Dr. Bose's letter and enclosures put up. He wishes to go to England to lecture and exhibit his apparatus during the vacation. He would be away for about 3½ months, from early in April to late in July.

He wishes, of course, to be assisted to make this journey, whether by the utilization of his present grant or by a fresh grant. It may be found impossible to divert his present grant.

I believe he was helped to go to England on similar visits before, and there are obviously great advantages to be gained from encouraging him to utilise his vacation in this way. The papers concerning such visits should be looked up at once and Dr. Bose might be asked to come to the Secretariat and give the necessary information about them.

I should be glad to have a note before the 20th instant, as it is clearly of great importance that Dr. Bose should be able to reply to the invitations he has received with the least possible delay.

P. C. LYON—14-1-1914.

Ask Dr. Bose to come and see me on Friday afternoon or Saturday morning. Meanwhile look up all papers and let me have them as soon as possible.

H. F. SAMMAN—14-1-1914.

D.-O. No. 39.

CALCUTTA,

The 14th January 1914.

DEAR DR. BOSE,

With reference to your proposal to go to England during the coming summer I wish to know what assistance Government has given you on similar occasions in the past. It would facilitate matters if you could explain this to me personally. Could you come and see me on Friday afternoon between 2 and 4 or on Saturday morning between 11 and 1? If so, I should be much obliged.

Yours sincerely,

H. F. SAMMAN.

TO PROFESSOR J. C. BOSE, C.I.E., M.A., D.SC.,
Presidency College, Calcutta.

THE terms given to Dr. Bose while on deputation in 1896 and 1900 are stated in Sir A. Earle's letter No. 18182, dated the 30th September 1907. Those granted in 1908 are mentioned in the Secretary of State's despatch No. 45 Public, dated the 10th April 1908.

Dr. Bose has been given a scholarship of Rs. 2,000 a year by the Government of India towards the expenses of his research work and an annual subsidy of Rs. 2,500 by this Government for the prosecution of his scientific studies at the Presidency College.

S. N. G.—16-1-1914.

E. MILSOM—16-1-1914.

Dr. Bose came to see me on Friday. He told me that he wished to stay in Europe till September, his programme being as follows :—

Lectures at Oxford and in London till June.

Attend Science Congress in France in July and in Germany in September.

This would necessitate his absence from active work at the Presidency College for three months (July to September); the remaining period would fall in the summer vacation and Puja vacation.

He suggested one of two things—either taking vacation leave from April to June and then being placed on deputation for three months from July to September, or, secondly, being placed on deputation for the whole period.

I have since discussed the position with the Director of Public Instruction.

The conditions of Dr. Bose's previous deputations in 1896 and 1900 are stated in the Director of Public Instruction's letter No. 18182 of the 30th September 1907. Those of 1908 are contained in the Secretary of State's despatch No. 45, Public, dated the 10th April 1908.

The difficulty about the present deputation is that Dr. Bose's extension of service will expire at the end of May, and until the question of further extension is decided it is hardly possible to consider the question of his being placed on deputation after May. A reference to the Government of India will, in any case, be necessary, and it seems essential for us to state in our letter exactly the conditions on which we propose to extend Dr. Bose's services.

Dr. Bose told me that he had heard from Sir K. G. Gupta that the Secretary of State had sanctioned our proposals regarding the increased facilities to be given him for the purpose of aiding him in the prosecution of his scientific researches (Bengal Government letter No. 1274 T.—G., dated the 14th July 1913). The Secretary of State's orders have not yet been received. If Dr. Bose is to carry on his researches under the auspices of Government it seems essential that he should remain in Government service and attached in some way to the Presidency College for the next four or five years. If his connection with the Presidency College be wholly discontinued it is difficult to say how he will be able to carry on his researches. If, however, he retains any connection with the college it is for consideration how the development of the Physics Department of the college will be affected thereby. It is obviously undesirable to divorce research from teaching, and I understand that in a European university the senior Professor, even though engaged in entirely original research, would be the Head of that particular section of scientific teaching. Is it considered desirable that Dr. Bose should continue for the next four or five years to be the head of Physics Department of the Presidency College? Mr. James thinks that it is not. But he is not very clear in his proposals for the future. Dr. Bose desires to retain his official position and suggests that he should be created Director of Physico-Physiological Research. This however would amount to splitting the Physical Department into two parts—one for teaching, and the other for research. Dr. Bose being given authority only over the latter. The separation of research from teaching would incidentally debar the professor in charge of the teaching branch from full facilities for research.

There might, it is true, be a Physico-Physiological Department as distinct from the Physics Department, but in that case the relationship between the two departments would have to be determined.

According to the present orders of Government (Government order No. 5628, dated the 19th December 1913), Dr. Bose is to be relieved of all official connection with and all responsibilities for the Physics Department of the Presidency College and its laboratories. But the Accountant-General, Bengal, has since raised an objection and has enquired what particular appointment Dr. Bose will hold, or whether he is to be considered as on special duty during the period of his retention.

In order to reply to the Accountant-General, Bengal, and to have definite proposals to submit to the Government of India it seems desirable to state the whole position to the Principal of the Presidency College, and to ask for his definite proposals in the matter. I do not think that any definite promise can be given to Dr. Bose until the orders of the Government of India have been received.

H. F. SAMMAN—19-1-1914.

THIS would mean such delay as would prevent Dr. Bose's lectures in Europe this year.

P. C. LYON—20-1-1914.

TAKEN up to Hon'ble Member who is unwilling to defer orders regarding Dr. Bose's deputation to Europe till the general question has been decided. For the present the period of Dr. Bose's extension should be increased by three months. In view of our recommendations to India regarding Dr. Bose's research work it is probable that his service will be extended for several years and it may therefore be assumed that he will rejoin and continue at work after his deputation is over.

Hon'ble Member approves of Dr. Bose being sent on deputation for the vacation (April to June) on similar terms to those granted on the last occasion. If India's sanction is required it can be asked for by telegram.

Consult Financial Department and with their consent draft a telegram to India asking for sanction. If India's sanction is required to both extension of service and deputation, it should be asked for with consent of Financial.

H. F. SAMMAN—21-9-1914.

OUR powers are as follows:—

We can sanction the extension of Dr. Bose's services up to any period (*see* section 459 of the Civil Service Regulations).

We can create a special post for six months so long as the pay with allowances does not exceed Rs. 2,500. See the resolution of the 15th of July 1912 [section V(3)].

We cannot sanction any deputation outside India except to a British possession in India for six months (*see* article 84 A. of the Civil Service Regulations). The sanction of the Secretary of State is required.

It is not yet clear whether the Education Department intends Dr. Bose to continue in his present post while purely departmental arrangements are made for carrying out his work or whether they intend that he should fill a special post.

S. K. SAWDAY—21-1-1914.

H. L. STEPHENSON—21-1-1914.

D.-O. No. 63.

CALCUTTA,

The 22nd January 1914.

DEAR DR. BOSE,

In connection with your proposed visit to Europe next summer I write to inform you that the sanction of the Secretary of State will be necessary to your deputation out of India. This creates certain difficulties which I should be glad to discuss with you to-morrow. I shall be much obliged if you will kindly come between 10 and 10-15 A.M.

Yours sincerely,

H. F. SAMMAN.

TO PROFESSOR J. C. BOSE, C.I.E., M.A., D.SC.

Presidency College, Calcutta.

I SPOKE to Mr. James on Saturday about Dr. Bose's deputation to Europe and attach a note of the interview. Mr. James has no objection to the deputation, but wishes the question of his position with reference to the Presidency College after his return to be decided at once.

I submit a draft to the Government of India asking for sanction to the deputation, after discussing the case with Financial Secretary and Director of Public Instruction. The draft will have to be approved by Financial before issue.

The draft does not make any reference to the financial aspect of the question. In 1907 the cost of a similar deputation for 18 months was estimated at Rs. 15,526*. On this basis the cost of the present deputation may be estimated at about Rs. 5,000, viz.:—

	Rs.
(1) Fare from Calcutta to Bombay and back ...	179
(2) Passage from Bombay to London and back by sea ...	1,716
(3) Travelling allowance in Europe—say ...	1,500 †
(4) Daily allowance at $\frac{1}{2}$ a guinea a day for six months ...	1,433
Total ...	4,828
or (in round figures) ...	5,000

† In 1907, Rs. 5,000 was estimated for 18 months.

This amount is not provided in the education budget, and it is impossible to suggest any specific reappropriation now, but it is probable that the amount can be met by reappropriation.

As regards the carrying on of the work in Dr. Bose's absence it will be necessary to appoint another officer either in his place or in Mr. Peake's. The ordinary staff of the Physics Department is two professors—Dr. Bose and Mr. Peake. Since Dr. Bose has been on light work there have been three professors, Dr. Harrison, a supernumerary, being attached to the Physics Department. We have informed

‡ 136 of 10th January 1914.

India† that we consent to Mr. Peake's deputation to Simla for meteorological training on his return from furlough (February 1st) and we have said that we will take steps to recruit an officer in his place on receipt of India's orders. Till that officer is recruited some temporary arrangement will have to be made. Mr. James suggested either Mr. Macdonald or Mr. Meek, but the Director of Public Instruction doubts whether either of these officers can be spared. Mr. Macdonald is on deputation to Sibpur from Dacca, leaving only Mr. Meek at Dacca. Failing this, some other arrangement can be made for next term, but it will probably not be altogether satisfactory.

Mr. James rather likes the idea of Dr. Bose being away for a whole term if he is to relinquish charge of the physics side. He thinks that the transition from his present position to the new one, whatever that may be, will be made easier by this break of a term.

If Hon'ble Member approves, the letter to India may issue with consent of Financial and then the general question may be taken up on the lines suggested in the last paragraph of my note of 19th January 1914 on page 7.

The orders of the Secretary of State on the grant of Rs. 18,000 towards the cost of Dr. Bose's special research work were received yesterday and are under circulation.

H. F. SAMMAN—31-1-1914.

Interview with Mr. James on the 24th January 1914.

MR. JAMES has no objection to Dr. Bose being granted vacation leave and deputation for six months in all, but he desires that definite orders should be passed, as regards his position with reference to the Presidency College after he returns. The difficulty lies in the grants and the workshops.

The grants.—The Physics Department of the Presidency College has an annual laboratory grant which is under the control of the Senior Professor of Physics. At present Dr. Bose is applying some two or three thousand rupees out of this grant to his research work. It is undesirable that this should continue.

The indent for apparatus will have to be sent to England shortly, and it is essential to decide at once whether the money shall be at Dr. Bose's disposal or not. If Dr. Bose retains his position as senior Professor of Physics, and Dr. Harrison merely acts for him, then the final approval of the indent will, in fact, rest with Dr. Bose. Mr. James would prefer that Dr. Harrison should be appointed substantively as senior Professor of Physics from the end of this term, and would like to be informed of this at once.

Workshops.—At present Dr. Bose has full control of the workshops, and he has the sole use of them for the greater portion of the week. When Dr. Bose ceases to hold charge of the Physics Department he should be allowed the use of the workshop not as of right, but only as a matter of courtesy when the senior Professor of Physics can conveniently arrange for this.

Mr. James says that a special laboratory can be placed at Dr. Bose's disposal in the Baker Laboratory Building.

If Dr. Bose be placed on deputation, it will be necessary to appoint another Professor of Physics in the Presidency College. Mr. Peake is at present on leave and will be going on

* The heavy work of this department will fall in Dr. Bose's absence—monsoon period.

§ Sibpur.

¶ Dacca.

deputation to the Government of India for one year. If Dr. Bose goes on deputation there will only remain Dr. Harrison who has his meteorological work§ in addition to the work of the Presidency College. Mr. James suggested either Mr. Macdonald || or Mr. Meek ¶.

H. F. SAMMAN.

THE letter may issue if Financial approves. I have already discussed the subject with His Excellency.

I shall be glad if any criticisms on the letter Financial Secretary may wish to make, should he consider it to be inadequate.

P. C. LYON—31-1-1914.

—————
To Financial Secretary.

H. F. SAMMAN—31-1-1914.

—————
THE terms of the deputation are as before and we may agree. While he is on deputation it will be possible to fill his post. If orders are not passed as to what he is to do on his return, by the time he comes back, the Accountant-General will not pass the pay of the gentleman who is to take his place.

S. K. SAWDAY—3-2-1914.

—————
I HAVE no criticism on the draft.

H. L. STEPHENSON—3-2-1914.

—————
THE letter may now issue.

H. F. SAMMAN—4-2-1914.

—————
Yes, issue at once, please.

P. C. LYON—5-2-1914.

[No. 15.]

O. I. No. 598, dated the 5th February 1914.

—————
PLEASE see the last paragraph of Secretary's note, dated the 31st January 1914 on page 8 of notes. Director of Public Instruction may perhaps see these papers now, so that he may write to Mr. James with reference to the last paragraph of Secretary's note of 19th January 1914.

S. K. B.—14-2-1914.

S. N. G.—14-2-1914.

—————
E. MILSON—14-2-1914.

MR JAMES has been consulted. A copy of his demi-official No. 76, dated the 21st February 1914, embodying his proposals is put up in the file, together with copies of his letters of September 20th and November 26th to which he refers.

W. C. WORDSWORTH—26-2-1914.

—————
D.-O. No. 76.

CALCUTTA,

The 21st February 1914.

MY DEAR WORDSWORTH,

My proposal concerning Dr. Bose's extension of service are contained in my letter No. 1416, dated the 20th September 1913. They were—

- (1) that Dr. Bose's service should be extended for one year (paragraph, 2); but
- (2) conditionally on arrangements being made under which Dr. Bose would not remain in charge of the Physics Department of the college (paragraph 5).

In a subsequent letter No. 1772, dated the 26th November 1913, I advised that Dr. Bose's services should be retained on the staff of the college up to the close of the present session, that is, to the 9th April next.

The proposals now made by the Government of Bengal, and in part sanctioned by the Secretary of State, appear to be—

- (1) an additional grant for the development of Dr. Bose's special research work;
- (2) extension of the period of Dr. Bose's services for not less than three years.

Clearly the grounds for relieving Dr. Bose of all the responsibilities of service on the staff of Presidency College are greatly strengthened. It appears to me obvious that Dr. Bose should be considered to be on special duty from the end of the present session at Presidency College (when I understand his six months' deputation to Europe will begin) for the whole of the further period during which his services are retained by Government.

Consequently if my proposals are accepted Dr. Bose will not hold any official position on the staff of Presidency College after the close of the present session. As, however, it is possible there may be difficulty in at once providing Dr. Bose with a suitable laboratory in

which to carry on the researches on which he is engaged I should be willing to agree that Dr. Bose should for the time being be allowed to retain for his use the rooms in the Baker Laboratory building now occupied by him as his private room and special research room. It would need, however, to be expressly defined that Dr. Bose would have no claim to any part of the maintenance grant of the College (either for apparatus or contingencies) or right to the use of the workshops.

2. It will not, perhaps, have escaped the notice of Government, that if three years' extension is granted to Dr. Bose, Government is to all intents and purposes absorbing one of the higher personal allowances of which there are at present only two for the whole of Bengal. This does not seem to me to be fair. I may note in passing that an extension of service for three years appears to be at variance with article 459 of the Civil Service Regulations which says: "In every case the extension should be given for not more than one year at a time." The proposals made for Dr. Bose are intended to be exceptional. Therefore if Dr. Bose is to retain a personal allowance in addition to his deputation allowance, the allowance should be additional to those sanctioned for the Indian Educational Service. Dr. Bose should, I think, be regarded as virtually outside the Indian Educational Service in Bengal, as for instance Dr. Ross has been, since he was appointed to the charge of the records under the Government of India.

Yours sincerely,

H. R. JAMES.

To W. C. WORDSWORTH, Esq.,

Assistant Director of Public Instruction, Bengal.

No. 1416, dated Calcutta, the 20th September 1913.

From—H. R. JAMES, Esq., M.A., Principal of the Presidency College,

To—The Director of Public Instruction, Bengal.

WITH reference to your No. ¹²⁷⁰⁴_{9 12 12-88} dated the 8th August, I have the honour to say that I have ascertained that it is Dr. Bose's desire that his service should be extended; and there can be no question of his physical fitness. Dr. Bose's eminent distinction as a man of science and his achievements in the line of research which he has followed are also well known to Government.

2. I therefore recommend that an extension of service for one year be granted to Dr. Bose; but at the same time I think it would be more expedient, if he were now set free by Government to devote his whole time and energies to his own research work and be relieved of the responsibilities at the present time devolving upon him as Senior Professor of Physics in this college. I make this latter recommendation in the interest of the physics work at Presidency College as well as of Dr. Bose's own research work.

3. My reasons are these:—The supervision of the actual teaching work in physics in Presidency College especially since the occupation of the new laboratories is so onerous that it cannot be adequately met unless the professor in charge of the department is prepared to give the greater part practically the whole of his time to it. This on his own showing Dr. Bose has never been prepared to do since his return from leave in July 1909; for he came back on a definite understanding that he should only be expected to give a limited portion of his time to his duties as professor. He also stipulated that he was to be quite free for his own research work for three days in the week. I expressed at the time to Government opinion that the arrangements proposed were contrary to the best interests of the laboratory, and I was able to obtain from Sir Edward Baker the concession that Dr. Harrison was retained in the college as "supernumerary" professor of physics. This has worked fairly well, so long as there have really been three professors of physics; but it has not been possible to keep this arrangement continuously: and whenever as at the present time, one of the two other Indian Educational Service professors is away on leave or on deputation the work suffers. Four years experience as Principal since 1909, also confirms me in the opinion that in general it is not expedient to have a professor on the staff of a college who claims on the strength of a definite compact to give so much work to the college and no more.

4. I am well aware of the distinction which Dr. Bose's name and reputation have brought to Presidency College when his research work was first begun. I think it would be a fitting recognition of the achievements and services, if Dr. Bose's connection with the college were continued by appointing him Emeritus Professor in the College. But research work so absorbing as Dr. Bose's is not really compatible with the full active discharge of the exacting and onerous duties of senior professor in charge of the physics department.

5. Dr. Bose has himself recently addressed Government with a view to obtaining facilities for more extended investigations and I have already had the opportunity of expressing the opinion that important results may be anticipated, if the facilities he asks for are provided for Dr. Bose. If these facilities are granted to Dr. Bose, he might also be set free to devote himself entirely to research. If some such arrangement can be made, my recommendation holds good. But I cannot recommend an extension of service except on the condition that Dr. Bose shall not remain at this college in charge of the physics department.

No. 1772, dated Calcutta, the 26th November 1913.

From—H. R. JAMES, Esq., M.A., Principal of the Presidency College,
To—The Director of Public Instruction, Bengal.

I HAVE the honour to invite reference to the correspondence resting with this office letter No. 1416, dated the 20th September 1913, concerning Dr. Bose's extension of service.

The date at which Dr. Bose attains the age of 55 is the 30th of this month in four days' time. As no orders have yet been passed on my letter I think it now necessary to advise that Dr. Bose's services should be retained in the college at least to the end of the session 1913-14.

PLEASE see Accountant-General, Bengal's letter No. 2521 G.A., dated the 5th January 1914. Dr. J. C. Bose, the Senior Professor of Physics at the Presidency College, was granted an extension of service for six months with effect from the 30th November 1913, and on the recommendation of the Director of Public Instruction he was at the same time relieved of all official connection with, and responsibility for, the Physics work of the Presidency College and its laboratories pending further orders defining his position. This arrangement did not involve the appointment of any other Professor of the Indian Educational Service in his place, and it was intended that his lecturing work will be carried out by the existing staff during his absence.

Mr. James points out that it is not practicable to relieve Dr. Bose of his present responsibilities on the staff of the College, until suitable arrangements have been made for carrying out his work when his connection with the College will cease, and therefore proposes that he should be retained on the College staff up to the end of session 1913-14, up to the date from which the long vacation of the College commences.

This puts a different complexion to the case, and, if Mr. James' proposal is accepted, there will be no necessity of placing Dr. Bose on deputation as suggested. We may simply issue a revised order to the Accountant-General, Bengal, to the effect that Dr. Bose has been granted an extension of six months and that he will remain as a Professor of the College up to the present session of 1913-14. The Financial Department may first be consulted as to whether this would meet Accountant-General, Bengal's objection.

The present staff of Physics in the Presidency College consists of—

- (1) Dr. J. C. Bose.
- (2) Mr. C. W. Peake.
- (3) Dr. E. P. Harrison (supernumerary).

It is proposed that Dr. Bose should be deputed to Europe for a period of six months probably from the middle of April when the College vacation commences, and we have agreed to Mr. Peake's deputation to Simla for meteorological training, so that when the College re-opens there will be one Professor of Physics to carry on the work. Mr. James suggested Mr. Macdonald or Mr. Meek, but the Director of Public Instruction doubted whether any of them could be spared. This would necessitate some other arrangement. Meanwhile Dr. Harrison will be the senior Professor of Physics and will probably be in charge of the laboratories.

The question of the appointment of a substantive head of the laboratories depends on Dr. Bose's future status and his position with reference to the Presidency College. The proposal to keep him on the staff of the College and at the same time to relieve him of all work in that connection, is apparently objectionable from an Accounts point of view, while to keep him specifically and as a permanent measure on research work, will require the sanction of the Government of India or the Secretary of State, as the work which Dr. Bose will undertake forms no part of the duty of the Indian Educational Service unless the existing arrangements is continued whereby Dr. Bose is required to lecture from 9—12 hours a week and permitted to devote the remainder of his time to research work.

In view, however, of the interest of Physics work of the College, Mr. James is of opinion that from the commencement of his deputation in April up to the time he is employed in research works he should be considered on special duty, and that he will not hold any official position on the staff of the College. He will, however, be allowed the use of the rooms of the Baker Laboratory building which he is at present occupying, but not to claim any part of the maintenance grant of the College or right to the use of the workshops. This arrangement will require the sanction of the Government of India, and we have already promised to submit to them proposals in this connection.

With regard to the question of personal allowance raised in Mr James' letter, it may be noted that at present there are three senior personal allowances and four junior allowances in this province. One of the senior allowances is held in abeyance on Mr Archbold's appointment as Principal of the Dacca College, while of the other two, one is vacant on the retirement of Mr. Prothero, and the other is held by Mr. P. B. Mukerji, Inspector of Schools in the Presidency Division. Dr. J. C. Bose is at present holding a junior allowance, and as he is in the top of the list, the vacant allowance will in the ordinary course go to him. The next officer is Mr. James. Hon'ble Member was inclined to think that Dr. Bose should be definitely taken off the sanctioned strength of the College and that the allowance which will remain vacant, while he remains on deputation should be filled up, but that Dr. Bose

should continue to draw full pay on extension of service while he is engaged on present researches. This means that Dr. Bose should draw Rs. 1,500 during the period of his deputation, while the allowance to be held by him should be set free for others. These are questions which may be decided in consultation with the Financial Department later; meantime, we may issue order to the Accountant-General, Bengal, as suggested at A above, with the consent of the Financial Department.

H. G. D.—14-3-1914.

CONSULT Financial on A.

E. MILSOM—15-3-1914.

If Dr. Bose is to continue in his present post, the Accountant-General can have nothing to say.

S. K. SAWDAY—24-3-1914.

ALL we can do now is to modify the orders previously passed so as to make it clear that Professor Bose continues to hold his appointment as Senior Professor of Physics during his extension till further orders are passed.

I had intended the reference to Director of Public Instruction regarding future status of Dr. Bose to be official, so that the Director of Public Instruction could come up with definite proposals. The unofficial reference and demi-official reply from Mr. James do not carry us forward. The official reference should be made as soon as the orders modifying the previous Government order have issued to remove Accountant-General Bengal's objections. Please draft now and I will take Hon'ble Members orders. One draft modifying previous Government order, another to Director of Public Instruction to lay the case before the Principal and to submit definite proposals to Government regarding Dr. Bose's future status.

H. F. SAMMAN—26-3-1914.

Two drafts submitted for approval.

S. K. B.—27-3-1914.

E. MILSOM—27-3-1914.

To meet the Accountant-General, Bengal's objection (No. 2521 G. A., of 5th January 1914) it is necessary to give Dr. Bose a definite appointment or to place him on special duty. The question of Dr. Bose's deputation to England has been referred by India to the Secretary of State this month, so there may be some delay in receiving the Secretary of State's sanction which cannot be assumed in anticipation.

I think the simplest plan is to continue Dr. Bose in his appointment as Professor of Physics in the Presidency College, pending further orders which will be passed on receipt of definite proposals from the Director of Public Instruction regarding Dr. Bose's future status and position with reference to the Presidency College. By that time probably the Secretary of State's orders regarding his deputation will have been received.

In the last paragraph of my note of 19th January 1914, I suggested that the whole matter should be laid before the Principal, Presidency College, for submission of definite proposals. I repeated this suggestion on 31st January 1914. Hon'ble Member did not pass orders specifically on this point, but after the letter to India had issued the matter was referred to Director of Public Instruction unofficially. I had intended an official reference and I fear the demi-official from Mr. James to Mr. Wordsworth has not carried matters very much further than they were before. I recommend that an official reference be now made and submit a draft for Hon'ble Member's consideration. I also submit a draft modifying the previous orders of Government to such an extent as appears necessary to meet the Accountant-General, Bengal's objections. I do not think that this will make any substantial difference in the present position.

H. F. SAMMAN—29-3-1914.

ISSUE. The drafts appear to meet the immediate necessities of the case. But it must be remembered that the Principal of the Presidency College cannot be made wholly responsible for the adjustment of the present situation. It is Government that is encouraging the further research work of Dr. Bose, and this work is wholly outside the sphere of the ordinary work of the Presidency College. It is rather Government that is inclined to insist that, although Dr. Bose is no longer working for the college, he should still continue to use the College laboratory.

When Director of Public Instruction has further considered the case, he might discuss with Secretary and the Hon'ble Mr. Beatson Bell before passing his final proposals.

P. C. LYON—1-4-1914.

ISSUE and show this to Director of Public Instruction.

H. F. SAMMAN—1-4-1914.

[Nos. 17-18.]

O. I. No. 1607-9, dated the 4th April 1914.

SEEN. Thanks.

W. W. HORNELL—7-4-1914.

CALCUTTA,

The 30th March 1914.

DEAR MR. LYON,

You rightly found fault with me for not bringing before the Government the question of research laboratory, and the case of my assistants. In extenuation I may say that at the request of Government I had on several occasions submitted schemes, but nothing came out of them. The only thing that has been successful was your representation last year.

In the enclosed memorandum I have asked for—

- (1) the appointment of my two research assistants and the assistant in charge of construction of apparatus ;
- (2) the construction of a well-equipped physico-physiological research laboratory at a cost of 4 lakh of rupees ;
- (3) the increase of annual grant from Rs. 18,000 to Rs. 30,000 a year to meet all recurrent expenses in payment of staff and maintenance of laboratory and experimental gardens.

May I hope to see you at my Royal Institution lecture on the 29th May ?

Your sincerely.

J. C. BOSE.

TO THE HON'BLE MR. P. C. LYON, C.S.I., I.C.S.,

Member of the Bengal Executive Council.

CALCUTTA,

The 30th March 1914.

DEAR SIR,

My researches for the last eighteen years have been carried out under considerable difficulties, and I wish to express my grateful acknowledgments to His Excellency the Governor of Bengal and to yourself for the facilities which the Government intend to offer for their continuance.

You were kind enough to ask me to submit a scheme embodying the requirements for the efficient carrying out of my investigations. I beg therefore to enclose the following recommendations :—

1. *Regarding assistants.*—You have on several occasions expressed your appreciation of the zeal shown by my assistants in the discharge of their duties. Their whole-hearted devotion to intellectual pursuits and their quiet and unceasing activity for the advancement of knowledge might perhaps serve as example to the student community. As they have worked taking no care for the future, it is therefore the more necessary for me to draw on their behalf the kind attention of the Government, and I would recommend their being taken in the Government service. I think that the new line of research that has been initiated, will be continued by my assistants even after my death. In any case, these highly trained men will be able to render material assistance in the different agricultural colleges and the research institutions. When the full scheme of the laboratory is in operation, then I would beg the Government to take the whole staff under their service. For the present, I shall only ask for sanction for two research assistants and one to supervise the construction of delicate apparatus—

- (a) Surendra Chandra Das, M.A., has already worked for nearly five years as research scholar. I recommend him for an appointment as an assistant on Rs. 100 rising to Rs. 125 a month.
- (b) The second research assistant, Guruprasanna Das, L.M.S., has proved himself most efficient and I expect much from him in the future. For the present, he may be given a temporary appointment of Rs. 125 a month.
- (c) Narendra Nath Sen has after three years of special training under me developed wonderful capacity for guiding the construction of most delicate apparatus. On previous occasions, I trained two men, one after another. They were promptly taken away by the technical school and another institution, the pay offered being twice that I could afford from my limited grant. Narendra Nath Sen is a very good man, and I do not think he could render finer service than in the construction of instruments which will be highly appreciated in the scientific world. As there was no definite prospect under me,

he has been thinking of applying for a Government technical scholarship. I do not think it right to stand in his way, unless a permanent employment be given to him. Under these circumstances, I beg that he should be given a post of an assistant in charge of the Mechanical Department on a pay of Rs. 75 rising to Rs. 100.

2. *Experimental gardens*—It was proposed to have three gardens, the first one in town, the second in the suburbs, and the third at a hill station. As regards the first, lease of land in the city has become very uncertain. I had therefore to purchase a plot of land at my own expense, of which 35 cottahs are being laid out for the experimental garden. The monthly rent of land on Circular Road is from Rs. 6 to Rs. 7 per cottah; taking the lower figure the rent for 35 cottahs will be 6×35 or Rs. 210 per month. The Government may at its discretion allot me Rs. 200 a month as the rent of the land.

As regards the garden in the suburbs, I have to modify the original plan; this is to meet the reduction of grant from rupees twenty-four to rupees eighteen thousand a year. I therefore beg to propose that instead of my renting a garden in the suburbs (which is often very malarious), the Government be pleased to order my using one-half of the inspector's bungalow at Sijbaria (near Ulubaria) as an observation station. The place is healthy. Half of the bungalow used to be occupied by the Subdivisional Officer of Public Works Department. This is now vacant as a new house has been built for him. In this matter the kind interest of Mr. Adams Williams would be very helpful.

In addition to the above, I intend to make frequent excursions to the suburbs of Calcutta within a radius of 20 miles for collecting specimens suitable for experimental purposes. For this I may be allowed a conveyance allowance of Rs. 1,200 a year.

As regards the experimental garden at the hill station, I shall undertake it after my return from Europe.

3. *Physico-physiological research laboratory*.—I shall now take up the question of the equipment of a research laboratory and the necessary establishment. It is obvious that no important and exhaustive investigation can be undertaken without the resources of a well-equipped laboratory. It will be seen from the annexed paper (appendix I) * that so far back as the year 1896, my investigations had the good fortune of meeting with

* This should be reproduced in the notes as an appendix to this letter.
H. F. SAMMAN—24-10-1914.

appreciation from Lord Kelvin and other leading members of the Royal Society, and they urged on the Secretary of State for India the desirability of allowing me the facilities of a well-equipped research laboratory. In response to this Lord George Hamilton recommended to the Government of India the expenditure of £40,000 (6 lakhs of rupees) for the purpose, but the scheme could not be carried out at the time.

Since then the scope of my investigations has been very much extended. I am however submitting a scheme for physico-physiological research laboratory estimated to cost only 4 lakhs of rupees or two-thirds of the cost of the earlier scheme. Any further reduction will not be conducive to efficient working. I beg to subjoin an estimate of immediate and recurring expenses—

(a) Purchase of 3 bighas of land for the laboratory and grounds—	Rs.
at an approximate cost of Rs. 30,000 a bigha	... 90,000
(b) <i>The buildings</i> .—The laboratory will be three storied building and will contain—	
(1) A section for electrical research.	
(2) A section for physiological research.	
(3) A section for botanical research.	
(4) A photographic section for taking continuous galvanometric record.	
(5) A section to be maintained at constant temperature and constant illustration.	
(6) A reference laboratory—(Cost of building)	... 1,50,000
(c) <i>Workshop</i> .—Set of lathes, planing, milling machine and other appliances for construction of work of great precision, also materials	... 20,000
(d) <i>Scientific apparatus</i> .—Full equipment of electrical instruments, photographic appliances, collection of apparatus for biological research, set of automatic recorders, optical instruments, thermal regulators, chemical apparatus and material	... 60,000
(e) Cost of electric wiring, water and gas connections, steady vibration pedestals and tables, heavy stand and glass cases	... 30,000
(f) <i>Outdoor gardens</i> .—Cost of building green-house and accessories, water-plant garden, and garden house at hill station	... 50,000
Total	... 4,00,000

4. *Recurrent expenditure :—*

The working of the laboratory could be carried out efficiently if the Government be pleased to raise the present annual grant of Rs. 18,000 to Rs. 30,000 as estimated below :—

(a) Staff of assistants :

- (1) Assistants in charge of physiological section.
- (2) „ botanical section.
- (3) „ electrical „
- (4) „ photographic section.
- (5) „ in charge of mechanical department.
- (6) „ department of plant culture.

Annual expenditure for six assistants on an average pay of Rs. 150 a month	...	...	10,800
(b) Four mechanics at an average pay of Rs. 50 a month each and two carpenters at Rs. 25 each	...	...	3,000
(c) Electrical overseer at Rs. 50 and garden overseer at Rs. 50 a month	...	...	1,200
(d) Expenditure in connection with the upkeep of three experimental gardens with travelling expenses and cost of transport	...	...	8,000
(e) Cost of annual indent of apparatus	...	...	2,000
(f) Menial servants, rates and taxes	...	...	2,000
(g) Purchase of books of reference—, cost of printing and diagrams	...	...	2,000
(h) Gas, electric bills and contingencies	...	...	1,000
Total annual expenditure	...	...	30,000

As the building operation will take some time, an early decision of the Government on the scheme will enable me to begin work without delay.

I expect to complete the investigations which are already in progress in the course of the next ten years of which the first two will have to be devoted more or less to the preliminary work of fitting up the laboratory and bringing the experimental gardens into working condition. Under these circumstances may I ask the Government to be so kind as to sanction the above expenditure at first for a period of five years, to be renewed on condition of my physical fitness, for another period of five years? The importance of my investigations has I am glad to say, been recognized. It will greatly help me if in the organization of very lengthy and difficult investigations, I can reckon on some measure of continuous support from the Government.

I remain,

Yours truly,

J. C. BOSE.

TO THE HON'BLE MR. P. C. LYON, C.S.I., I.C.S.,

Member of the Bengal Executive Council.

WE asked Dr. Bose to let us know the work he has in contemplation.

Please place these papers in the file and consider them in connection with his future work.

P. C. LYON—30-3-1914.

[No. 19.] Telegram, dated the 16th April 1914.

From—Calcutta.

From—Registrar, Bengal, General.

To—Darjeeling.

To—Bengal, General.

[INDIA Education wires. *Begins* No. 658 (Education). Your letter No. 598, dated the 5th February 1914. Secretary of State has sanctioned deputation of Dr. Bose to Europe for six months on same terms as in 1908.] Papers sent to Director of Public Instruction on the 6th April. File sent by that office to Principal, Presidency College. Director of Public Instruction has called for it, and will be sent immediately on receipt.

COPY of India's telegram may be sent to Director of Public Instruction, for information, and the receipt of the file from the Director of Public Instruction may be awaited.

H. G. D.—18-4-1914.

S. N. G.—18-4-1914.

R. B. STEELE—18-4-1914.

DRAFT endorsement submitted for approval.

H. G. D.—20-4-1914.

R. B. STEELE—20-4-1914.

[No. 19½.]

O. I. No. 72 T.—G., dated the 20th April 1914.

PLEASE see the telegram from the Government of India, intimating Secretary of State's sanction to the deputation of Dr. J. C. Bose to Europe for six months on the terms mentioned in our letter No. 598, dated the 5th February 1914. Dr. Bose has already been granted an extension of service for six months, with effect from the 30th November 1913, and it was contemplated in the concluding portion of the abovementioned letter that he should be granted a further extension of service for six months to cover the period of his deputation.

Dr. Bose's first extension expires on the 30th May 1914, while the period of his six months' deputation commenced from April 1914, so that the first two months are covered by his former extension and the further period of extension necessary is four months and one day to carry it to September 1914. We may first ascertain from the Director of Public Instruction the date on which Dr. Bose left for Europe. It was estimated that the deputation would cost about Rs. 5,000. This amount is not provided in the current year's Education Budget, and the Director of Public Instruction will probably meet it by reappropriation. The future status and position of Dr. Bose with reference to the Presidency College, will be considered on receipt of Director of Public Instruction's proposals called for in our letter No. 1607, dated the 4th April 1914,

H. G. D.—22-4-1914.

As proposed at B.

R. B. STEELE—22-4-1914.

Dr. Bose left for England on the afternoon of April 2nd.

W. C. WORDSWORTH—27-4-1914.

DRAFT submitted for approval. It may issue after Director of Public Instruction has seen.

H. G. D.—29-4-1914.

R. B. STEELE—29-4-1914.

1. THANK you for letting me see the draft as to which I have no criticisms to offer.

2. The general question of the arrangement which are to be made to enable Dr. J. C. Bose to continue his research work with which he is connected, the question of the future of the Physics Department of the Presidency College, Calcutta, seems to me to be thick with difficulties. So far as my office is concerned the matter rests with the General Department letter No. 1607, dated the 4th April 1914, in which I have been asked to discuss the whole position with the Principal of the Presidency College and to consider whether certain proposals already submitted should not be amended in the light of various observations, which are contained in that letter. This matter is now under consideration of the Assistant Director, but on looking through this file, I find that Dr. Bose, apparently at the request of the Hon'ble Mr. Lyon, has submitted a long list of proposals, involving the expenditure of a considerable amount of money, for his future researches. I do not know what action your department proposes to take on Dr. Bose's letter to Mr. Lyon, dated the 30th March 1914, and I have not done more than glance through this letter but obviously if the recommendations which Dr. Bose has put forward in this letter, are to be accepted, they will modify very considerably the conditions of his future employment. It seems to me that my office can scarcely put up proposals for Dr. Bose's future employment which are likely to be of much value until Government have decided what action, if any, they are going to take with reference to the recommendations made in Dr. Bose's semi-official letter to Mr. Lyon, to which I have just referred.

W. W. HORNE—30-4-1914.

THE draft put up may now issue. Director of Public Instruction evidently refers to the notes, dated the 30th March 1914, submitted by Dr. J. C. Bose to the Hon'ble Mr. Lyon who ordered them to be considered in connection with his future work. The proposals involved therein are—

- (1) the appointment of two Research assistants and the assistant in charge of construction of apparatus.
- (2) The construction of a well equipped Physico-Physiological Laboratory at a cost of 4 lakhs of rupees.
- (3) The increase of the annual grant from Rs. 18,000 to Rs. 30,000 a year.

We have already sanctioned the retention of two of his assistants on Rs. 100 per mensem during Dr. Bose's absence in Europe and the question of their retention, will be considered when Dr. Bose's future position and status is settled.

The second question is directly connected with his future work, about which we have invited the opinions of the Principal of the Presidency College and the Director of Public Instruction and no decision could probably be arrived at on them at present unless Government is in a position to know the exact lines on which to proceed. Dr. Bose's notes therefore do not seem to affect the present issue, but we may send a copy of the notes to Director of Public Instruction for consideration in connection with the proposals called for in our letter No. 1607, dated the 4th April 1914.

The question of increasing the grant from Rs. 18,000 to Rs. 30,000 will require the sanction of the Secretary of State. In sanctioning the present grant of Rs. 18,000 the Government of India have expressly stated that the work was not of a nature on which Government funds can ordinarily be expended.

H. G. D.—2-5-1914.

ISSUE.

R. B. STEELE—2-5-1914.

[No. 20.]

O. I. Nos. 229-30 T.—G., dated the 4th May 1914.

PLEASE see Director of Public Instruction's note on page 16 *re* Dr. Bose's demi-official to Hon'ble Member. Need this be considered until the question of Dr. Bose's future status in the Presidency College is settled?

R. B. STEELE—5-5-1914.

DR. BOSE has recently been granted Rs. 18,000 a year to help him in his research work. For some time past his position at the Presidency College has been anomalous, as his research work has taken up much of the time which would ordinarily have been devoted to the control of the Physics Department of which he is the nominal head.

In Government order No. 1607, dated the 4th April 1914, the Director of Public Instruction was asked to consult the Principal of the Presidency College and submit revised proposals for his future work—the previous proposals submitted by Director of Public Instruction being open to objections stated in the Government order.

Just before going on six months' deputation to England (*i.e.*, just as this Government order was about to issue), Dr. Bose submitted to Hon'ble Member a request that Government should give him further assistance, including the construction of a specially equipped research laboratory* and the increase of the annual grant from Rs. 18,000 to Rs. 30,000. Hon'ble Member's order was to place these papers on the file, and to consider them in connection with Dr. Bose's future work.

* Estimated cost 4 lakhs.

The Director of Public Instruction wishes to know what action Government propose to take on this request before he submits his proposals. It seems very unlikely that funds will be forthcoming to finance these proposals, and it is also necessary to have the Director of Public Instruction's advice on their merits. I think we may send a copy of Dr. Bose's letter, and its enclosures, demi-officially to the Director of Public Instruction for consideration in connection with the proposals for which we have asked him officially.

The question of the laboratory seems to be the most important—as if this were constructed there would be no apparent reason for Dr. Bose retaining any official connection with the Presidency College. I do not think we should be justified in expending 4 lakhs on this when there are so many other urgent demands on our funds, which we are at present quite unable to meet; nor do I think that we have any good case for asking the Government of India for the money. The grant to Dr. Bose is for only 3 years in the first instance, and the laboratory, if built, would not be ready very long before this period expired. I do not know what view the Hon'ble Mr. Lyon held as regards this; but if Hon'ble Member thinks the laboratory out of the question, we might tell the Director of Public Instruction so in sending him the papers.

H. F. SAMMAN—8-5-1914.

For the present we may simply send to Director of Public Instruction, in continuation of our letter, dated the 4th April 1914, a copy of Dr. Bose's letter, dated the 30th March 1914. We should ask Director of Public Instruction to consider these further proposals in submitting his report. At present I am not prepared to express an opinion, but Dr. Bose's demand is certainly a large one.

N. D. BEATSON BELL—10-5-1914.

A DRAFT demi-official is submitted for approval.

H. G. D.—12-5-1914.

BETTER send unofficially.

H. F. SAMMAN—13-5-1914.

SENT unofficially.

H. G. D.—19-5-1914.

[Nos. 21-23.] Endorsement from the Government of India, Department of Education, No. 757, dated the 30th April 1914.

THE main file on the subject is still with Director of Public Instruction. The Secretary of State's orders conveyed in his telegram, dated the 8th April 1914, sanctioning the deputation of Dr. J. C. Bose to Europe has already been received and communicated to the Director of Public Instruction, Bengal, with this department endorsement No. 72 T.—G., dated the 21st April 1914.

A copy of the endorsement with enclosures may be sent to Director of Public Instruction in continuation.

(A draft endorsement is submitted for approval.)

H. G. D.—11-6-1914.

S. N. G.—11-6-1914.

H. F. SAMMAN—13-6-1914.

[No. 24.]

O. I. No. 396 T.—G., dated the 16th June 1914.

D.-O. No. 160.

DARJEELING,

The 23rd May 1914.

MY DEAR SAMMAN,

I received yesterday afternoon copies of some notes of the General Department file conveying to me a copy of Dr. Bose's letter of the 30th March 1914 to Mr. Lyon, asking that I shall deal with it in submitting the report which is called for in Mr. Milsom's letter No. 1607, dated the 4th April 1914.

2. I have now been through all the papers in my file and have written a note to Mr. Gilchrist giving my views and asking him to draft to Government. I am very anxious that the letter which I shall now submit to Government should be a comprehensive survey of all the difficulties connected with Dr. J. C. Bose. But I am afraid that the previous papers in my office file are very incomplete. Might I have your file as I think that Mr. Gilchrist ought to have it before him when he drafts. I do not think that there is anything confidential in it, and if there is, I will take every precaution to see that the file is handled as a confidential one.

Yours sincerely,

W. W. HORNELL.

TO THE HON'BLE MR. H. F. SAMMAN, I.C.S.,

Secretary to the Govt of Bengal, General Department.

No. 2594 J. & P.

INDIA OFFICE, WHITEHALL, S. W.,

The 10th July 1914.

DEAR SIR,

From Secretary, Public Department,
India Office, to Joint Secretary to Govern-
ment of India, Education Department,
dated the 1st July 1914, with enclosure.
Ditto of 10th July 1914, with enclosures.

I forward, for information, copy of the papers noted in the margin, on the subject of the extension of the period of deputation of Dr. J. C. Bose.

Yours faithfully,

M. C. SETON.

To the Chief Secretary to the Government of Bengal.

No. 2388 J. & P.

INDIA OFFICE, WHITEHALL, S. W.,

The 1st July 1914.

DEAR SIR,

With reference to the correspondence ending with the Secretary of State's telegram of the 8th April last, I forward, for information, copy of the paper noted in the margin on the subject of the extension of the period of deputation of Dr. J. C. Bose of the Indian

Educational Service.

The Secretary of State will probably address the Government of India by telegraph on the subject.

Yours faithfully,

M. C. SETON.

To the Joint-Secretary to the Government of India, Department of Education.

THE ROYAL SOCIETY OF MEDICINE,
1, WIMPOLE STREET, W.,

The 24th June 1914.

SIR,

May I take the liberty of asking whether we may hope that the leave of Professor J. C. Bose of Calcutta, who is at present in England, may be extended, at least, until the end of October next, in order that the many medical and scientific men who are interested in his work may have the opportunity of having it demonstrated before them at the beginning of the next session of this society in October.

You are probably aware that Professor Bose has carried out some extraordinary and entirely original experiments in electrical re-actions on plants and animals, which have evoked great interest in the medical profession.

Professor Bose has been able to lecture on the subject at Oxford and Cambridge, and on the Continent, but there has been no adequate opportunity for a demonstration before the medical profession in London, nor can there be until the resumption of the medical sessions in October.

Your early reply will greatly oblige.

I have, etc.,

J. G. W. MACALISTER.

To SIR THOMAS W. HOLDERNESS, K.C.S.I., B.A.,

India Office, S.W.

No. 2594 J. & P.

INDIA OFFICE, WHITEHALL, S. W.,

The 16th July 1914.

DEAR SIR,

With reference to my letter No. 2388 J. & P., dated 1st July 1914, I forward, for information, copy of the papers noted in the margin, on the subject of the extension of the period of deputation of Dr. J. C. Bose.

Letter from Professor Molisch, Vienna, dated 29th June 1914 (translation).
Letter from Dr. J. C. Bose, dated 8th July 1914.

Copy of this letter and of my previous one, with enclosures in each case, are also being sent to-day to the Chief Secretary to the Government of Bengal.

Yours faithfully,

M. C. SETON.

To the Joint-Secretary to the Government of India, Department of Education.

TRANSLATION.

PELANZENPHYSIOLOGISCHES INSTITUT.

VIENNA,

29th June 1914.

MY LORD,

I beg the favour of your kindly sending my thanks to the Government of India for Professor Bose's visit to Vienna. At a lecture delivered at Vienna before a large gathering of scientific men, Professor Bose very kindly enlightened us as to the contributions made by his book, already so well known in Europe, on the Sensitiveness of Plants.

The very interesting experiments carried out by Professor Bose make much clearer than heretofore the sensibility of plants, and indeed reveal to us reactions and a community between plant and animal life where heretofore this was impossible.

This great progress in the difficult region of plant physiology was rendered possible by the wonderfully ingenious apparatus which Professor Bose constructed, and which aroused universal admiration among experts. They belong to the best and finest instruments which the physiology of plants possesses for registering the movements and reactions of plants.

Professor Bose's paper made a great and lasting impression upon us all, and we are truly grateful to him for it. While expressing my best thanks to the Government of India for making it possible for Professor Bose to come to Vienna, I remain, with the highest respect.

Your obedient servant,

PROFESSOR DR. HANS MOLISCH.

P.S.—My school and I would gladly welcome Professor Bose again if he should decide to come back shortly to Vienna to make known to us still more fully his interesting researches.

C/o., MESSRS. HENRY S. KING & Co.

9, PALL MALL, LONDON,

The 8th July 1914.

SIR,

I have been sent on scientific deputation to lay the results of my researches before the various scientific bodies of the West. During the past three months I have addressed the English universities and other important bodies, and have given frequent demonstrations to various scientific groups, my work having been received with high appreciation.

I beg that the period of my deputation here may be continued until next May for the following reasons:—

1. The European scientific term has come to a close, and will not re-open before the middle of October.

2. The Royal Society of Medicine has invited me to deliver a lecture before its members, as they regard my work as of much importance to medical investigation. This lecture would take place on October 30th.

3. I have communicated a paper regarding a very important discovery to the Royal Society of London. This is expected to come for discussion in the middle of November, when my presence would be very necessary.

4. I have been invited to address the various scientific university centres in Germany and France, where my work has aroused markedly keen interest. These demonstrations of my results, and the discussions on their bearings on scientific advance with the highest scientific authorities, would be of benefit to science here and a stimulus to my investigations in India.

5. The Secretary of State has recently, at the recommendation of the Governments of Bengal and India, sanctioned a grant for researches in plant-life. One object of enquiry is the effect of cold climate, such as that of Europe, on normal plant-reactions. This I had intended to work out in India, by carrying on my researches in the hills. But actual work in Europe would be far more satisfactory, and a few months of work here in winter and spring could be very desirable. My absence in Europe will not interfere with work in India, for my assistants there are carrying on the work regarding which I left detailed instructions; I hear from them by each mail, and all necessary instructions and advice are forwarded to them weekly by return.

6. Certain new instruments which I have devised could not be constructed in India for lack of special mechanical appliances, I wish to have these constructed under my personal supervision. I have reason to believe that these new instruments will materially advance scientific investigation.

7. The Universal Congress of Botanists meets in London in the first week of May 1915. Such an opportunity of meeting at the same time with so many scientific men specially interested in my work can never again occur.

May I therefore ask the favour of your kindly referring the matter to Government of Bengal?

I have, etc.,

J. C. BOSE.

To the Under-Secretary of State for India.

[No. 25.] (1) From the Director of Public Instruction, Bengal, No. 389, dated the 26th June 1914.

(2) From the Secretary, India Office, Judicial and Political Department, No. 2594 J. P., dated the 10th July 1914, and enclosures

We have not yet heard anything from the Government of India about the proposed extension of the deputation, and we need not move in the matter until a reference is made to this Government.

H. G. D.—27-7-1914.

It is very gratifying to hear that Dr. Bose's work is being so well received in Europe. There is little doubt that we shall have to give the extension of deputation for which he asks. This will necessitate an extension of service too. As the Director of Public Instruction points out such extension cannot be arranged on a satisfactory basis without the Secretary of State's orders, it is, therefore, necessary to take up that question at once and address the Secretary of State (or ask India to do so) as early as possible. This can be done as soon as Director of Public Instruction's letter has been noted on and orders taken. I will get this done at once. Meanwhile Hon'ble Member may like to see the papers under disposal.

H. F. SAMMAN—28-7-1914.

SREN. Dr. Bose's transcendental work is beyond me, but I am frankly sceptical about it. It seems to me that the only sound solution is that Dr. Bose should take his pension as soon as possible, and that when he does so he should "cut the painter" with the Bengal Education Service and the Presidency College completely. He should then carry on his researches in retirement, being subsidised by the Government of India to whatever extent they feel inclined. I agree with Mr. Hornell in thinking that it would be monstrous to starve our schemes of practical educational reform in order to find funds from provincial revenues for Dr. Bose's experiments. It would also be monstrous to block promotion by retaining Dr. Bose in service indefinitely.

I presume that Dr. Bose furnishes accounts, with vouchers, for all the money which we entrust to him.

N. D. BEATSON BELL—30-7-1914.

NOTE on Director of Public Instruction's letter very early, please.

Also reference the answer to Hon'ble Member's question at C.

H. F. SAMMAN—30-7-1914.

Telegram from Government of India, Education Department, No. 118B.,
dated the 30th July 1914.

Telegram, dated the 30th July 1914.

From—Simla.

To—Dacca.

From—India, Education.

To—Bengal, General.

NUMBER 118 B. Education. Reference this department endorsement No. 757, dated the 20th April last. Deputation Dr. Bose for reasons which it is understood have been communicated direct to Bengal Government by India Office. Secretary of State willing to extend deputation till May next, if there is no objection. Has Governor in Council any objection to extension for this period?

D.-O. No. 233 Edn.

SIMLA,

The 27th July 1914.

DEAR MR. SAMMAN,

I am desired to send copy of a telegram, dated the 16th July 1914, from the Secretary of State. The first of the communications mentioned has been received and a copy of its enclosure is sent herewith. The second communication has not been received. Unless it discloses anything of importance, the Government of India will probably ask telegraphically for the views of the Government of Bengal on its receipt. It was thought it might be convenient to the Government of Bengal to have early intimation of the request which may be made regarding extension of Dr. Bose's deputation.

Yours sincerely,

H. SHARP.

TO THE HON'BLE MR. H. F. SAMMAN, I.C.S.,

Secretary to the Govt. of Bengal, Genl. Dept.

I HAVE received this to-day. I submitted the file, with Government of India's telegram, yesterday.

H. F. SAMMAN—1-8-1914.

ORDERS passed on file to-day.

N. D. BEATSON BELL—1-8-1914.

ACKNOWLEDGE with thanks and refer to the action taken.

H. F. SAMMAN—3-8-1914.

Telegram, dated the 16th July 1914.

From—London.

To—India, Education.

From—Secretary of State for India.

To—Simla.

My Public Secretary's letter No. 2388, dated the 1st July and No. 2594, dated the 19th July. Period of deputation of Bose. I am willing to agree to extension till May next if you have no objection. Please telegraph your views after consulting Government of Bengal.

A DRAFT telegram is submitted for approval. As the cost of his deputation will be met from Provincial Revenues, the approval of the Financial Department is necessary. Our first letter to India, recommending Dr. Bose's deputation for six months, was issued with the consent of the Financial Department.

H. G. D.—31-7-1914.

THE Government of India have now wired. We may reply as in the draft put up, with consent of Financial Department. The question of further extension of service (beyond May) will have to be considered on its merits in the light of Hon'ble Member's order of 30th July 1914, and the Government of India addressed as soon as possible.

H. F. SAMMAN—31-7-1914.

As proposed. If Financial agree we may allow Dr. Bose to be on deputation (presumably at our cost) up to May 1915.

I discussed the case with His Excellency. He thinks that the future financing of Dr. Bose should be done from Calcutta University, i.e., from Imperial Funds, unless private donations are forthcoming. This will have the same effect as my proposal of 30th July 1914.

N. D. BEATSON BELL—1-8-1914.

Issue the wire with consent of Financial Department. Then take further action.

H. F. SAMMAN—1-8-1914.

No objection, provided the Director of Public Instruction can find the money to meet the extra cost.

R. C. B.—5-8-1914.

E. MILSON—5-8-1914.

DIRECTOR OF PUBLIC INSTRUCTION may see. The telegram to India may then issue.

S. K. B.—7-8-1914.

Yes.

R. B. STEELE—7-8-1914.

W. C. WORDSWORTH—7-8-1914.

THE wire may now issue.

S. K. B.—8-8-1914.

R. B. STEELE—8-8-1914.

[No. 25.] Telegram No. 2976, dated the 8th August 1914.

From—Calcutta.

To—India, Education.

From—Bengal, General.

To—Simla.

GOVERNOR IN COUNCIL has no objection to extension of deputation of Dr. J. C. Bose till May 1915 and is willing to grant him further extension of service for that purpose.

[No. 25.] Letter from the Director of Public Instruction, Bengal, No. 389, dated the 26th June 1914.

DIRECTOR OF PUBLIC INSTRUCTION's letter fully explains the case. In his letter No. 19885, dated the 28th November 1913, the Director of Public Instruction recommended that Dr. J. C. Bose should be granted an extension of service for one year from the 30th November 1913, subject to the following conditions:—

- (1) that he should be relieved of all official connection with and responsibility for the Presidency College and its laboratories;
- (2) that he should be given the title of Emeritus Professor of the Presidency College, such title to be purely honorific; and
- (3) that should he wish to continue his researches at the Presidency College, definite and specific facilities as regards laboratory accommodation should be arranged for this by the Principal.

The first condition was suggested on the ground that the arrangement under which Dr. Bose was to lecture three days in the week was not found satisfactory and that in the interests of the Physics Department of the College the services of a whole-time Professor were necessary. As the acceptance of the proposals involved a reference to the Government of India, an extension of service of six months was granted to Dr. Bose to meet the immediate requirements of the case pending receipt of a reply from the Government of India for the grant to him of an additional sum of Rs. 18,000 a year for further facilities for research. Dr. Bose was however relieved of his official connection with the Physics laboratory of the Presidency College, but it was directed that he should be allowed the use of the laboratory to enable him to continue his research. This arrangement was afterwards objected to by the Accountant-General, Bengal, and the matter was re-adjusted by allowing Dr. Bose to continue to hold his appointment as Professor of the College. The Secretary of State sanctioned the annual grant of Rs. 18,000 for three years, and this coupled with his deputation to Europe has brought under consideration the future position and status Dr. Bose will occupy in connection with the Presidency College. Accordingly in Government order No. 1607, dated the 4th April 1914, we asked the Director of Public Instruction to consider in consultation with the Principal of the Presidency College the whole question of the arrangements to be made for the continuance of Dr. Bose's research work, and the proper organization and development of the Physics Department. The Director of Public Instruction was also requested to consider the further proposals made by Dr. Bose for the continuance and extension of his research work.

In the paper under disposal the Director of Public Instruction submits his detailed proposals for the consideration of Government under the various heads mentioned in Dr. Bose's memorandum.

I. Assistants.—Of the three assistants now working under him, Dr. Bose recommends that one should be appointed on Rs. 100—125 per mensem, the second should be given a temporary appointment on Rs. 125 per mensem, and the third on a pay of Rs. 75—100 per mensem. The total recurring expenditure is estimated at Rs. 3,300 for the first year rising subsequently to Rs. 4,200.

II. Experimental gardens.—Under this head the expenditure is estimated at Rs. 6,600 a year excluding rent for or interest on the capital sunk in the garden in the hills.

III. Physico-Physiological Research Laboratory.—The working expenses is estimated to amount to Rs. 39,000 year, and Dr. Bose suggests that the annual grant of Rs. 18,000 should be enhanced up to that amount. Besides this a capital expenditure of 4 lakhs is estimated, exclusive of the cost of the purchase of a garden in Calcutta and the hills.

The Director of Public Instruction is unable to give any opinion on the merits of the proposals, but states that Government would not be justified in incurring further expenditure on them; and is of opinion that in these matters private liberality should be the proper source for their support. Another question is raised in this connection by the Director of Public Instruction, viz., that permanent provision should be made for continuing the research after Dr. Bose's death. The Director of Public Instruction doubts whether persons able and willing to carry on the work will be forthcoming. The most important point for consideration however is, whether Dr. Bose should be granted extension of service beyond the age of 60 to carry on his research or that he should take his pension and do his work in retirement. Dr. Bose is now on deputation to Europe, which according to present arrangement, will expire in May 1915, and to cover this period a further extension of service up to that period will be necessary. But whether on his return he will be granted further extension is for consideration. The Directors of Public Instruction is strongly of opinion that the public funds should not be used for giving any further facility for research and he is strongly opposed to education grants being curtailed on this account. On the other hand the additional grant of Rs. 18,000 has been sanctioned for three years in the first instance from April 1914, and for this period he should be retained in the service of Government, but the terms on which he should be retained is for consideration.

As stated above Dr. Bose cannot be entirely relieved of his duties as a Professor during the period of his research work, as such a course will involve a reference to the Government of India. On the other hand the Director of Public Instruction and the Principal and Professors of the College are of opinion that his connection with the Physics Department should be completely severed and that he should not in the interest of the college be allowed to continue to be the senior Professor of Physics. This means that Dr. Bose shall

Rule V (3) of India's resolution No. 249.
B.A., dated the 15th July 1912.

be placed on deputation. This proposal will perhaps involve a reference to the Government of India as this work is outside the ordinary course of the administration.

The Director of Public Instruction, however, recommends that a new post should be created on a salary of Rs. 1,500 a month under the title of Director of Physiological Research for Dr. Bose. This will enable him to draw the rate of pay he is entitled to in the Education Department. It will however be seen that the Principal of the college and the Director of Public Instruction are willing to grant to Dr. Bose all facilities to work in the college subject to certain restrictions. The proposed appointment is urged on the ground that it will be impossible to promote during Dr. Bose's incumbency in the Indian Educational Service an officer to a first grade personal allowance and the other to a second grade allowance. The objection to this course which has already been made in our letter No. 1607, dated the 4th April 1914, perhaps no longer applies, as Dr. Bose will have no connection with the teaching of Physics in the college.

In paragraph 4 of our letter No. 598, dated the 5th February 1914, we have promised to the Government of India to submit definite proposals about Dr. Bose's future status and his position with reference to the Presidency College and a report may be made to the Government of India on the lines of Director of Public Instruction's proposals, should Government be prepared to accept them. In this connection a perusal is solicited of Hon'ble Member's note, dated the 30th July 1914, and the result of the discussion with His Excellency dated the 1st August 1914.

With reference to C of Hon'ble Member's note, dated the 30th July 1914, it may be noted, that Dr. Bose is required to submit a detailed account of this Government grant of Rs. 2,500 sanctioned in Government order No. 159T.—G., dated the 8th June 1896, to the Director of Public Instruction, showing how the amount has been spent. With regard to the Government of India grant of Rs. 2,000 for a research scholarship, no audit is required nor the audit officers are required to demand account of the expenditure of this sum. A report is however, required to be submitted to Government every year that Dr. Bose is carrying on his researches.

No final decision has yet been arrived at as to the conditions to be imposed on the recent grant of Rs. 18,000, but it is understood that Dr. Bose has submitted from England a statement to the Accountant-General, Bengal, showing how the advance taken by him out of the grant to defray his passage and other expenses in England.

This file has been sent to the Accountant-General, Bengal enquiring, whether the grant of Rs. 18,000 includes this Government grant of Rs. 2,500.

H. G. D.—2-9-1914.

THE Government of India will have to be addressed in any case whether it is decided that Dr. Bose should be placed on deputation or should be appointed to a temporary post. The objection to the former is that it would not set free a personal allowance.

R. B. STEELE—24-9-1914.

In paragraph 4 of our letter No. 598 of 5th February 1914, we promised the Government of India to submit definite proposal about Dr. Bose's future status and his position with reference to the Presidency College.

The Director of Public Instruction's proposals are for orders. The Director of Public Instruction would impose two conditions of the continuance and development of Dr. Bose's research work, viz.—

- (i) that the sums available for ordinary education work for the next few years be not in any way curtailed on account of any subsidy to Dr. Bose for his research work; and
- (ii) that the proper working of the Presidency College be not prejudicially affected by Dr. Bose's continuance of work there (Director of Public Instruction's letter, paragraph 10).

The order of the Hon'ble Mr. Beatson Bell of 20th July 1914 (page 21 of notes) and 1st August 1914 (page 22 of notes) may be seen.

The Director of Public Instruction proposes that a special temporary appointment on Rs. 1,500 be created for Dr. Bose. This proposal is made with the object of setting free a 1st grade personal allowance now enjoyed by Dr. Bose. I am doubtful whether this would necessarily follow; I think, therefore, that if this proposal be approved, we should state specifically that a 1st grade allowance should then be set free and ask for sanction to this. Personally I am in favour of letting Dr. Bose retire and giving him any concessions that may be considered necessary in addition to his pension.

I consider it essential that Dr. Bose's connection with the Physics Department be severed.

As Dr. Bose is already 55 years old, and there is no prospect at present that any one will be able to carry on his work after his decease, the expenditure of a large sum on a laboratory does not appear justified; nor does any large capital expenditure on garden experiments. The other proposals of Dr. Bose depend on the question of funds which Provincial revenues are not in a position to supply.

With these observations I support the Director of Public Instruction's proposals.

H. F. SAMMAN—3-10-1914.

I CONFESS I do not appreciate the scepticism which is shown in some quarters as to the value and importance of Dr. Bose's work. Being unskilled in scientific matters myself, and consequently unable to form a considered judgment as to its originality or accuracy, I am quite ready to take the advice which is offered to us by those who lead the scientific world, and they have spoken enthusiastically, and with much unanimity, on the subject.

It seems to me useless to suggest that Dr. Bose should depend upon private liberality for support. It is very doubtful whether he would get it from his own countrymen, and to leave him to that would probably mean an end to his labours. On the other hand Dr. Bose is the first and only Indian scientist who has distinguished himself in the paths of original research, and it appears to me to be clear that Government should do everything in its power to encourage him for political as well as practical reasons. As to the action that we should take, I entirely agree in the following recommendations; they have been made by various officers in the course of correspondence and discussions on this case:—

- (1) Dr. Bose should retire from the Indian Educational Service and take his pension.
- (2) He should then receive a special appointment, outside the Indian Educational Service, on a salary which, with his pension, will give him emoluments amounting to about Rs. 1,500.
- (3) He should cease to have any connection with the teaching staff or teaching arrangements in the Presidency College.
- (4) As rooms are available in the Presidency College laboratories, he should be given the use of such space as can be spared for him, both for his actual researches and experiments, and for his workshop.
- (5) He should be given adequate equipment, arrangements being made perhaps to enable him to make use of the more expensive and elaborate articles of the existing equipment of the Presidency College, should he require to use such occasionally.
- (6) His assistants should be given definite posts in the Subordinate or other Educational Services, and be deputed from those posts to work with Dr. Bose, receiving promotion or increments in due course while so working.
- (7) Dr. Bose should also have one garden in Calcutta, and for the rest should be allowed to use some small area of Government land at Sijbaria or elsewhere and also some small piece of garden in the hills. It does not seem to me to be necessary that he should have a separate garden in the hills.
- (8) Dr. Bose should have a reasonable grant for his research work and should be allowed either travelling or conveyance allowance as may seem most suitable.

I think that a draft may now be put up on these lines, for the consideration of His Excellency and perhaps of Council. It should set out the case fully, and we must, of course, ask for funds from the Government of India. It is obvious that Dr. Bose's work is not provincial or local, and that the success of his researches brings honour to all Indians and not only to those in Bengal, while his work is described as of world-wide value and importance.

P. C. LYON—8-10-1914.

DRAFT, please.

H. F. SAMMAN—9-10-1914.

A DRAFT is submitted for approval. Dr. Bose's demi-official, dated the 27th August 1914, with Hon'ble Member's orders thereon, is kept in the file.

H. G. D.—17-10-1914.

R. B. STEELE—21-10-1914.

PLEASE calculate and insert the annual cost in the last paragraph and let me have typed copy of the draft at once.

H. F. SAMMAN—16-11-1914.

It is proposed to give Dr. Bose Rs. 1,500 including his pension. Under article 474 (c) of the Civil Service Regulations Dr. Bose will be entitled to a pension of Rs. 5,000 a year, and deducting this amount from Rs. 18,000, the annual amount which Government will have to pay is Rs. 13,000 a year.

This does not take into account future promotion.

H. F. SAMMAN—17-11-1914.

It is also proposed to appoint three of his assistants as follows in the Subordinate Educational Service :—

	Rs.
One in grade V (Rs. 100) \times 12 =	1,200
One „ „ VI (Rs. 75) \times 12 =	900
One „ „ IV (Rs. 125) \times 12 =	1,500
	<hr/> 3,600

The total annual amounts therefore come up to Rs. 13,000 + Rs. 3,600 = Rs. 16,600.

H. G. D.—17-11-1914.

R. B. STEELE—17-11-1914.

I SUBMIT a draft to India on the basis of Hon'ble Member's orders of 8th October 1914. I have not given details as in paragraphs 4 and 5 of Hon'ble Member's order as it will, I think, suffice to embody these in the orders eventually issued to Director of Public Instruction. They are hardly required by India.

I have some doubts whether the Government of India will consent to Dr. Bose's retirement and immediate reappointment to a new post. The Director of Public Instruction's suggestion was that he should remain in service, but be transferred to a special post. My own suggestion was that he should be allowed to retire and be given any further financial assistance that might be necessary in the form of an addition to his present yearly grant. I did not contemplate the creation of a special post for him after retirement. I have, however, set forth the proposals contained in Hon'ble Member's order of 8th October 1914.

Paragraph 6 of Hon'ble Member's order.—I have selected grades in the Subordinate Educational Service that carry the pay suggested by Dr. Bose, or the minimum pay where that is progressive.

Paragraph 8 of Hon'ble Member's order.—The increase of Rs. 6,000 in Dr. Bose's present estimate is in establishment and other expenses connected with the laboratory. If the laboratory be not built, the present grant will suffice on the basis of Dr. Bose's present estimate. I have noted this in the draft, and suggested that no increase in the grant should be given now; but I have asked India to meet the cost of the special appointments for Dr. Bose and his three assistants. I hope this will meet with Hon'ble Member's approval. In this connection I would refer to Private Secretary to Governor's demi-official of 16th October 1914, to Hon'ble Member, and Hon'ble Member's orders on it. I have made no reference to the enclosures to this in the draft, partly because they have not been received officially and partly because they weaken Dr. Bose's case. In 1913, Dr. Bose submitted an estimate for Rs. 24,000 a year, out of which Rs. 18,000 was recommended by this Government and sanctioned by the Secretary of State. Then Dr. Bose asked for Rs. 30,000 (March 1914) on the strength of an estimate differing essentially from the previous estimate. Now Dr. Bose limits his request to only Rs. 24,000 (July 1914). A comparison of these estimates shows how very vague are Dr. Bose's ideas as to what he wants; his estimates have always been shaky, none of them will bear much scrutiny.

As regards the cost of the proposals, I think the figure Rs. 3,600 will need modification in view of prospects of promotion. This can be done in consultation with Financial Department before issue; I do not delay the case now as the draft is not affected. The approval of Financial Department will be required to the draft before issue.

H. F. SAMMAN—17-11-1914.

I HAVE modified the draft. I think an initial grant will be required for Dr. Bose's workshop and equipment, and that the grant will have to be raised to Rs. 24,000 for the maintenance of these accessories. Have the draft retyped and then send over to Financial for approval. On return from Financial it should go to His Excellency, who will, perhaps direct its circulation.

P. C. LYON—22-11-1914.

CARRY out Hon'ble Member's orders at A.

H. F. SAMMAN—23-11-1914.

THE ordinary rule for the calculation of the average pay of a graded appointment is that which is contained in article 141 of the Civil Service Regulations. As, however,

No exact calculation can be made, but Rs. 3,600 as calculated by General Department at page 25 may be taken as an approximate estimate.

R. C. B.

the periods of the deputation of the three assistants for employment will be temporary, this rule will not apply in calculating the actual cost of the entertainment of the three officers. An intelligent estimate will have, therefore, to be made which will depend on the period of employment under Dr. J. C. Bose. The draft, however, does not state for what period the temporary appointment should last. As it is an usual procedure to indicate the term of one temporary employment, the General Department should perhaps be asked to do this now. It is almost certain that the Government of India would like to know the period before sanctioning the proposal.

This will not, probably, be allowed in the case of non-recurring grant.
R. C. B.—27-11-1914.

from year to year.

For orders.

S. N. C.—27-11-1914.

R. C. B.—28-11-1914.

Office would also suggest that the Government of India should be asked to sanction specially the carrying forward of savings from the grants, both recurring and unrecurring

(1) In paragraph 2 of the draft a period of three years is suggested: some period should perhaps be specified in the proposals. We could then calculate the cost of the assistants' salaries.

(2) How long does it take these men as a rule to get promotion?

E. N. BLANDY—30-11-1914.

FINANCIAL DEPARTMENT'S note above. A period of five years might be fixed. In this event something might be said on the draft about renewing the present grant of Rs. 18,000 and continuing it till the termination of the period of the temporary appointment.

R. B. STEELE—1-12-1914.

WE had better say three years which is practically equal to the time that the grant will still have to run.

H. F. SAMMAN—1-12-1914.

E. N. BLANDY.

WE may, therefore, take that within the period of three years there will be no promotion and the figure may stand at Rs. 3,600.

R. C. B.—3-12-1914.

I TAKE it that General Department are going to modify the draft so as to make it clear that the proposal is for three years.

Before sending to Secretary please explain how the figure Rs. 16,600 in last paragraph of draft is arrived at.

E. N. BLANDY—3-12-1914.

PLEASE see Education Department office note dated the 17th November 1914 with reference to General Secretary's order dated the 16th November 1914 which shows how the figures of Rs. 16,600 has been arrived at. It now appears on re examination that this is perhaps not correct. The reasons are as follow :—

- (1) The papers put up do not show whether or not the cost of the entertainment of the three officers in the Subordinate Educational Service is included in the proposed grant of Rs. 24,000.
- (2) I have ascertained from the General Department that a moiety of the existing grant of Rs. 18,000 is met from Provincial revenues and the other half from Imperial revenues. It is presumed that General Department now propose that the whole extra sum of Rs. 6,000 (24,000—18,000) per annum should be given by the Government of India.

On this supposition and on the assumption that the proposed grant of Rs. 24,000 does not include the cost of the three teachers, the figure of Rs. 16,600 should perhaps be altered to Rs. 22,600. Before sending the file to Secretary the General Department may be asked to say if they agree with the above.

S. N. C.—4-12-1914.

R. C. B.—4-12-1914.

THE above calculation seems correct, but I am not sure, will your office verify?

E. N. BLANDY—4-12-1914.

THE additional recurring cost will consist of--

- (1) Rs. 6,000 on account of the existing grant of Rs. 18,000 being increased to Rs. 24,000.
- (2) Rs. 13,000 on account of Dr. Bose's pay.
- (3) Rs. 3,600 on account of the pay of the three research assistants.

These make a total of Rs. 6,000 + 13,000 + 3,600 = Rs. 22,600.

During the current year owing to difficulties pointed out by the Financial Department about debiting the cost of the pay of the assistants to Provincial revenues, we decided that it should be met from the newly sanctioned grant of Rs. 18,000, and that the assistants should be treated as private employes of Dr. Bose. We now propose that they should be admitted into the Subordinate Educational Service, and hence we must receive a grant outside the research grant. The Financial Department do not consider it necessary to modify Rs. 3,600 representing the annual cost of the three assistants as it is not likely that they should get any increase of pay during the currency of the grant.

The Financial Department's estimate of Rs. 22,600 may be accepted.

H. G. D.—7-12-1914.

S. N. G.—8-12-1914.

YEs.

R. B. STEELE—8-12-1914.

ALTERATIONS have been made in the draft.

R. B. STEELE—17-12-1914.

PLEASE see Hon'ble Member's order of the 22nd November 1914. The minor modifications in the draft have been made as suggested by Financial Department. The draft is now submitted for His Excellency's order.

H. F. SAMMAN—19-12-1914.

HIS EXCELLENCY is in general agreement with these views. He desires that the draft be circulated; then His Excellency will discuss in Council.

W. R. GOURLAY—23-12-1914.

CIRCULATED to—

Hon'ble Mr. N. D. Beatson Bell.

Hon'ble Nawab Saiyid Shamsul Huda.

H. F. SAMMAN—26-12-1914.

As at present advised I approve of the draft. I may have to modify my views when the matter is discussed in Council.

S. HUDA—28-12-1914.

To Hon'ble Mr. N. D. Beatson Bell.

H. F. SAMMAN—29-12-1914.

SEEN. I approve of the substance of the draft, i.e., that Provincial should not be called on to foot this Bill. My scepticism, I am sorry to say, remains.

N. D. BEATSON BELL—31-12-1914.

[Nos. 26-28.] From the Government of India, Department of Education, No. 1573, dated the 14th October 1914, and enclosures.

THE main file on the subject is still under submission. Meantime a copy of the above communication may be sent to Director of Public Instruction for information.

(Draft endorsement submitted for approval.)

H. G. D.—19-12-1914.

S. N. G.—19-12-1914.

R. B. STEELE—21-12-1914.

[No. 31.]

O. I. No. 4954, dated the 23rd December 1914.

Order in Council.

THAT the draft be approved, except that the period of the temporary post be fixed at five years instead of three, and consequential modifications be made in the draft.

CARMICHAEL—12-1-1915.

EXAMINE the draft in the light of the order in Council, and make the necessary modifications in consultation with Financial Department, if necessary.

H. F. SAMMAN—12-1-1915.

SECRETARY—

Amendments have been made in paragraphs 3 and 7. It is, I think, unnecessary to consult Financial again. No account has been taken of the possible promotion of the assistants; but as they are not likely to receive promotion until the fifth year, it is probably unnecessary to mention this. The excess could be met from Provincial revenues.

R. B. STEELE—14-1-1915.

HON'BLE MEMBER—

The draft has been modified in accordance with the order in Council.

Instead of calling Dr. Bose "one of the" few Indian scientists who have distinguished themselves, I have written "the foremost among" them.

H. F. SAMMAN—18-1-1915.

APPROVED. Issue.

P. C. LYON—20-1-1915.

[No. 32.]

O. I. No. 338, dated the 21st January 1915.

In Government order No. 229 T.—G., dated the 4th May 1914, Dr. Bose's service was extended for a further period up to the 2nd October 1914, to cover the period of his deputation to Europe.

In Secretary of State's Despatch No. 164, dated the 11th September 1914, Dr. Bose's deputation has been extended to such date in May as will admit of his arrival in India about the 15th June 1915. In our letter to India, No. 338, dated the 21st January 1915, in connection with Dr. Bose's future appointment, we have stated that an extension of service is being granted to him up to the date of the termination of his deputation. This being so, we may now issue orders extending his services up to the time of his arrival in India in June 1915, the question of further extension being left to be determined on receipt of orders from the Government on our letter No. 338, dated the 21st January 1915. Perhaps we may ask Director of Public Instruction unofficially whether he has any suggestions to make.

H. G. D.—15-2-1915.

S. N. G.—16-2-1915.

DIRECTOR OF PUBLIC INSTRUCTION—

Perhaps it would be as well to extend Dr. Bose's services up to the end of June.

R. B. STEELE—17-2-1915.

UNDER-SECRETARY, GENERAL DEPARTMENT—

Dr. Bose's deputation has been extended to such date in May as will enable him to come from Europe and arrive in India about the 15th June. There can of course be no possible objection to the extension of his service up to the date on which he arrives in India; but if extension be granted as suggested by you up to the 30th June, this may involve the return of Dr. Bose for the last fifteen days of June to the Presidency College as Senior Professor of Physics. This would upset the arrangements at the Presidency College, and I am fairly certain that Mr. James would object to the reversion of Dr. Bose to the College in his capacity of Senior Professor of Physics even for a few days. All that is required would seem to be an extension of his services as Senior Professor of Physics in the Presidency College up to such date as he may find himself back in Bengal. The most convenient way would be to issue orders sanctioning the extension of his service up to the 15th June, and if he arrives after that date, to grant by a subsequent order the continuation of the extension up to the actual date on which he reports his arrival in Calcutta. The continuation of his services after the date of his arrival in Calcutta will, I understand, be in accordance with the conditions which the Secretary of State sanctions. There seems to be no objection to these conditions being established immediately on Dr. Bose's return.

W. W. HORNELL—18-2-1915.

We may perhaps accept the Director of Public Instruction's recommendation at A above and sanction an extension of service to Dr. Bose up to the 15th June 1915 for the present.

H. G. D.—20-2-1915.

SECRETARY—

As proposed. The last portion of Director of Public Instruction's note refers probably to the recent reference made to India.

R. B. STEELE—22-2-1915.

H. F. SAMMAN—22-2-1915.

[No. 33.]

O. I. Nos 1006-07, dated the 25th February 1915.

C/O MESSRS. HENRY S. KING & Co.,

9, PALL MALL, LONDON.

CHICAGO,

The 4th February 1915.

DEAR MR. LYON,

I thank you for your most cordial letter. I am happy to say that the success of my work here has greatly surpassed my expectations.

On account of the unhappy complications in Europe, science is likely to find a home for some time in the United States, especially as they are very generous in educational and scientific advance. The Bureau of Plant Industry spend annually 23 million dollars for advancement of agriculture. It was a matter of intense gratification to me that, after hearing my address, they regarded my work as of fundamental importance not only in theory, but also in practice. The audience that gathered at the invitation of the Academy of Sciences proved so large that even half the number could not get in. The President said that since the establishment of the Academy they never had a lecture of equal interest.

Not only is the work proving of importance in medicine, in physiology and in agriculture, but the psychologists are keenly interested in the possibility of the "Control of nervous impulse" which I had the pleasure of demonstrating before you immediately on discovery. The School of Psychologists at the Harvard University occupies a very high position in the world. Stanley Hall, President of the Clarke University, is also one of the leading psychologists of the day. I have received the most cordial invitations from both these Universities, and assurance of high appreciation of the importance of the work.

The Smithsonian Institution, the greatest scientific association in America, recognizing the importance of my researches, has through the Board of Regents submitted a report of it to the Congress. I was specially invited to give a lecture at the State Department in Washington before the Secretary of State and other members of the Cabinet. They not only expressed their high appreciation of the work, but much gratification at the courtesy shown by the Governments of India and Great Britain in deputing one of their officers to this country for the advancement of science.

They have at the Columbia University initiated a course of plant physiology based on my new methods. In many places here they regard the Calcutta laboratory as likely to offer better training for post-graduate scholars in plant physiology than even in Germany. I have received a letter from the Columbia University enquiring whether there are "facilities in your laboratory for the reception of foreign students who are desirous of familiarizing themselves first hand with your apparatus and instrument."

I know you will be highly gratified by this acknowledgment of our status in the world of science and our Universities will now realize one of its greatest functions.

My strength and the devotion of my pupils will not fail in carrying the work much further. Before leaving India you asked me to submit a scheme for a research laboratory. I have submitted a memorial on similar lines to the Secretary of State. In this there was an item of well equipped workshop and *special* instruments without which further advance would be very difficult. These appliances would cost about £4,000, a large number of which have to be made of a special design which can only be explained personally.

I shall be grateful for your kind help in this matter. With sincere regards.

Yours very truly,

J. C. BOSE.

To THE HON'BLE MR. P. C. LYON, C.S.I., I.C.S.,

Member, Bengal Executive Council.

PRIVATE SECRETARY TO GOVERNOR—

I think that this letter from Professor J. C. Bose will interest His Excellency. He seems to be having great success in America. I hope that he may be able to get some millionaire there to help us in financing.

P. C. LYON—15-3-1915.

HIS EXCELLENCY has read with great interest and thanks Mr. Lyon for allowing him to see.

W. R. GOURLAY—26-3-1915.

GENERAL SECRETARY—Please put up with the file. I have not yet replied.

P. C. LYON—27-3-1915.

HON'BLE MEMBER—

The file is submitted.

Our letter No. 338 of 21st January 1915 to India and Dr. Bose's memorial of 23rd July 1914 to the Secretary of State may be read.

H. F. SAMMAN—30-3-1915.

THANKS. We shall probably hear again before long.

P. C. LYON—1-4-1915.

[Nos. 34-37.] From the Secretary, Judicial and Public Department, India Office, London, No. J. and P. 669, dated the 3rd March 1915.

RECEIVED from the Private Secretary to Governor. To General Secretary for perusal by the Director of Public Instruction

J. G. CUMMING—28-3-1915.

SECRETARY—

For perusal of paper under disposal and enclosures. Hon'ble Member may like to see this.

R. B. STEELE—10-4-1915.

HON'BLE MEMBER.

K. C. DE—10-4-1915.

SEEN. We have had nothing from Dr. Bose to indicate that he wants a capital grant of Rs. 60,000 for instruments, except a private letter to me.

P. C. LYON—10-4-1915.

HON'BLE MEMBER—

He returns on the 15th June. We may await his return. He has been told by the Secretary of State to apply to Bengal Government and he has not done so yet.

K. C. DE—12-4-1915.

P. C. LYON—13-4-1915.

[No. 38.] From the Government of India, Department of Education, No. 733, dated the 16th April 1915.

SUBMITTED for information. No orders.

H. G. D.—23-4-1915.

SECRETARY.

R. B. STEELE—23-4-1915.

HON'BLE MEMBER—For perusal of India's letter.

K. C. DE—23-4-1915.

This is very interesting and the result should be even more so.

P. C. LYON—24-4-1915.

APPENDIX.

SCHEME FOR THE ESTABLISHMENT OF A CENTRAL RESEARCH LABORATORY UNDER THE DIRECTORSHIP OF PROFESSOR J. C. BOSE.

LORD KELVIN addressed the following letter, dated 23rd October 1896, to the Secretary of State for India:—

“I believe it will be conducive to the credit of India and to scientific education in Calcutta, if a well-equipped Physical Laboratory is added to the resources of the University of Calcutta in connection with the Professorship held by Dr. Bose.”

Subsequently the following memorial from the leading scientific men in England was presented on 12th April 1897, to the Secretary of State for India, in regard to a proposed Research Laboratory for India:—

“MY LORD,—We, the undersigned, interested in the progress of Physics desire respectfully to draw your Lordship's attention to the great importance which we attach to the establishment, in the Indian Empire, of a Central Laboratory for advanced teaching and research in connection with the Presidency College, Calcutta, the most important educational institution under the Government of India. We believe that it would not only be beneficial in respect of higher education, but also that it would largely promote the material interests of the country, and we venture to urge on you the desirability, therefore, of establishing in India a Physical Laboratory worthy of the great Empire.”

This memorial bore the signature among others of Lord Lister, President, Royal Society.

Lord Kelvin, F.R.S.

Professor R. B. Clifton, F.R.S.

R. S. Ball, F.R.S.

Professor Carey Foster, F.R.S.

Professor C. F. Fitzgerald, F.R.S.

Dr. J. H. Gladstone, F.R.S.

Dr. J. H. Hopkinson, F.R.S.

W. Huggins, F.R.S.

Professor J. H. Poynting, F.R.S.

Sir W. Ramsay, F.R.S.

Sir H. E. Roscoe, F.R.S.

Sir A. W. Rucker, F.R.S.

Sir G. G. Stokes, F.R.S.

Professor S. P. Thomson, F.R.S.

The scheme was also supported by Sir Charles Schwann and other influential members of Parliament. The Secretary of State wrote to the Government of India recommending the establishment of a Research Laboratory in Calcutta at an initial cost of £40,000.

5A-154

11.1.17

REFERENCE TO FORMER CASES.

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"	"	$\frac{4-C}{29}$, A	" " DECEMBER 1895 " 59-62.
"	"	$\frac{2-P}{2}$, A	" " JUNE 1896 " 3-9.
"	"	$\frac{4-C}{23}$, A	" " SEPTEMBER " " 13-20.
"	"	$\frac{4-C}{23}$, B	" " DECEMBER " " 44-46.
"	"	$\frac{2-P}{8}$, A	" " " 1897 " 6-12.
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"	"	$\frac{2-D}{1}$, A	" " AUGUST " " 5-12.
"	"	$\frac{2-D}{11}$, A	" " DECEMBER " " 30-32.
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"	"	$\frac{10-C}{8}$, A	" " APRIL " " 96-101.
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"	"	$\frac{2-D}{8}$, A	" " " " Nos. 26-30.
"	"	$\frac{11-R}{1}$, B	" " SEPTEMBER " " 203-204.
"	"	$\frac{2-D}{3}$, A	" " OCTOBER " " 10-12.
"	"	$\frac{4-A}{32}$, B	" " SEPTEMBER 1909 " 203-204.
"	"	$\frac{11-R}{1}$, A	" " MAY 1915 " 99-114.

REFERENCE TO LATER CASES.

KERP-WITE.

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