

Home (1918) Department.
Education

Ordinary SERIES.

G.O. No. 290

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INDEXED

[Despatch Abstract.]

State scholarship.

Communicating to the Director of Public Instruction/letter
from the Government of India on the subject of the award in the current
year of a State technical scholarship to Mr. P. I. Mathai and the memo-
randum prepared in the Indian Students Department at London in connec-
tion with the award of State technical scholarships in 1917.

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From

The Hon'ble Sir E.D. MacLagan, K.C.I.E., C.S.I.,
Secretary to the Government of India.

To

The Secretary to the Government of Madras,
Home (Education) Department.

Sir,

With reference to the correspondence ending with this
Department letter no. 583, dated the 4th August 1917, I am
directed to forward, for the information of the Governor in
Council, a copy of a memorandum prepared in the Indian
Students' Department at London in connection with the award
of State technical scholarships in 1917, and to say that,
in the circumstances explained therein, the Government of
India are now not prepared to reconsider their previous
decision not to award Mr. P.I. Mathai a technical scholarship
for the study of plumbing and sanitary engineering.

I have the honour to be,

Sir,

Your most obedient servant,

Frederick William

for Secretary to the Government of India.

H.U.

Edu. 5.

ENCLOSURE.

MEMORANDUM.

The Despatch of the Government of India (No. 11 of 1917, Department of Education) raises the question of the standard of qualifications which Indian students ought to have reached before proceeding to England for technical study and training. It suggests that there is a discrepancy in the standard of qualifications recommended in the Report of the Committee appointed by Lord Crewe in 1912, to enquire into the system of State Technical Scholarships, and that recommended by the Educational Adviser in his letter No. 329-17 I. S. (dated the 26th April 1917) to the Department of Education. But a comparison of the two series of recommendations shows that there is not sufficient ground for supposing that any discrepancy exists.

Subject.	Standard recommended by	
	Morison Committee.	Educational Adviser.
Engineering:— (a) General (including Mechanical, Electrical and Civil Engineering).	A training in mathematics, physics, chemistry and engineering-drawing of a sufficiently advanced character to enable him to join the second-year class at once. The Indian Universities could greatly facilitate the careers of these men by supplying them with authoritative certificates showing in what subjects they have passed the B.A. and Intermediate examinations. (pp. 35-36.)	B. Sc. or B. Eng., with knowledge of drawing (especially free-hand and geometrical) and practical mensuration.
(b) Special:— (i) Electrical Engineering.	No Indian student should attempt to study electrical engineering unless he has read up to the B.A. standard in mathematics. (p. 39, sec. 68.)	<i>Id.</i> <i>id.</i>
(ii) Mining Engineering.	At least the Intermediate Science standard, and a competent knowledge of physics, chemistry and mathematics.	B.Sc. standard in chemistry, physics, mathematics, mechanics and practical geometry.

Thus, in the general recommendations of the Morison Committee for engineering students, the B.A. student is clearly indicated by the suggestion that they should bring certificates showing in what subjects they have passed this examination; and the same standard is implied, in describing the training as one that will enable the student to join the second-year class at once; universities, colleges and technical schools in this country will not grant exemption from attendance in the first-year engineering class to an Indian student whose qualification (especially in mathematics) is lower than that of the B.A., B.Sc., or B.Eng. The chief ground for the insistence on this high standard is the fact that the education given in an Indian college in applied mathematics and applied science generally falls much below that required in this country, owing to the fact that college laboratories in India are not so well equipped and are not provided with the most recent machinery and apparatus; the education given there tends to proceed more on lines of pure theory, with

the result that an Indian student cannot keep pace with the work of an English class in applied mathematics and science, though their knowledge of pure mathematics and pure science may not be greater than his. In the special recommendations of the Morison Committee, the B.A. standard in mathematics is specifically required from the student of electrical engineering; and in mining engineering, though the Intermediate Science standard is laid down as a minimum, experience has shown that this does not imply the "competent knowledge of physics, chemistry and mathematics" that is required, and this special recommendation should be interpreted in the spirit of the general recommendations that have preceded it.

There does not, therefore, appear to be sufficient ground for assuming that "the Morison Committee suggested the I.Sc. as the minimum standard for mechanical, electrical, or mining engineering students," and (as pointed out above), Indian students cannot obtain the exemption that will enable them to join the second-year class of an engineering college at once, on the basis of so limited a qualification. The recommendations of the Educational Adviser are thus in harmony with those of the Morison Committee, and differ only in being stated in more positive terms and in enumerating the requisite degrees; they are based on experience of the amount of exemptions that Technical Scholars have been able to obtain in the past, and on experience of the amount of time that has been wasted by some of them who have had to spend the first year of residence in this country on elementary studies that might well have been completed in India, and have had to receive private tuition to enable them to keep up with the rest of their class. It must be remembered that though the designations of examinations held by the Indian Universities are borrowed from those in use in English Universities, the standard of intellectual attainment required is not the same in the two cases; and in regard to the subjects of study referred to in the present Despatch, the Morison Committee report, "We were given to understand by English and Scotch professors of engineering 'who had had under them students from Rurki and Sibpur, that the 'standard of engineering instruction in India, especially in mechanical and 'electrical engineering, is not at the present time as high as the corresponding standard in this country.'" (Page 35, paragraph 66 (ii).)

The Principal of the Rurki College has protested against this unfavourable judgment. (Government of India, No. 5 of 1917, Department of Education, Enclosure No. 4, dated 12th February 1914, page 3, paragraph 9), but the fact remains that Engineering Faculties in this country are influenced by it in considering applications for exemption.

One addition, however, may be made to the recommendations discussed above, viz., that, where the standard recommended by the Educational Adviser is that of the B.Sc., the B.A. may be accepted in its place, provided that this latter examination has comprised the special subjects mentioned in the recommendation.

As it is proposed that the general question of the standard of qualifications that should be required from candidates for technical scholarships shall be subjected to revision after the receipt of the Report of the Industrial Commission, some considerations may be offered here as to the kind or class of men to be selected for such scholarships. The choice lies between two distinct classes, the *officer* class and the *artisan* class. Now, the experience of the last 13 years has shown that an adequate training in this country can be arranged for such Government of India Technical Scholars as propose on their return to India to enter the officer class, as electrical, mechanical, or mining engineers, managers or superintendents in weaving or dyeing mills, or managers of factories (sugar, pottery, leather, &c.). But similarly successful training cannot be obtained for Government Technical Scholars who are expected to remain in the artisan class. The difficulties in the latter case are two-fold; first, all such students who have been sent to this country hitherto by the Government of India have come with a determination to better their own condition and to fit themselves for employment in the cadre of the officer class; the journey, second class in a Peninsular and Oriental steamer, brings

them from the outset into association with a social class to which they have not hitherto belonged, and on their arrival in England they inevitably meet with a large number of Indian students whom they find to be looking forward to employment in the higher grades of service in India, and they resolve to seize similar opportunities for fitting themselves for posts with a higher rate of pay than that which they could hope to gain if they kept to the lines of training originally planned for them; they resist all attempts to keep them to a purely practical training, and adopt every possible device to obtain academic distinction. The case of P. B. Roy (who came in 1911) is typical in this respect. He was placed in the Electrical Standardizing, Testing and Training Institution, Limited, to be trained as an electrical engineer with such an amount of book work and class instruction as was necessary to serve as a basis for his practical work. Surreptitiously he worked for the B.Sc. Degree of the University of London; the strain of this double effort and the mental worry he suffered from the opposition in this Office to his attempt, led to his breakdown in 1913, and to these circumstances also may possibly be attributed his early death this year. Another instance is that of Ram Lal, who came in 1913; he likewise obstinately insisted on working for a University Degree and was prepared to resign his scholarship rather than take up the course of practical training which was most suitable for him. Experience has shown that there is no method of discipline in such cases, other than the withdrawal of the scholarship and of the grant for the return passage to India, and that technical scholars are ready to run the risk of such loss rather than give up what they consider to be a legitimate ambition. Other instances (e.g., H. D. Bennett, P. R. Duncan, V. M. S. Bailey) might be given in which the scholar has steadily resisted the attempt to make him confine his attention to practical work, and has succeeded in carrying out his intention of working for a Degree or Diploma. Another scholarship student, W. Sorby, who was selected in 1914 for a purely practical training in mechanical and electrical engineering, having worked in the shops of the North-Western Railway as a millwright, was made clearly to understand at the time of his selection that he was to remain in the artisan class; before he began to draw his scholarship, he joined the Indian Army Reserve of Officers, came to this country after having been wounded and is now working in the Woolwich Arsenal; in spite of the detailed plans made before he left India for his training as an artisan, he has now determined to work for a Degree, and if his scholarship is for this reason withdrawn from him he will probably be able to obtain employment in this country and carry out his purpose.

Secondly, the conditions of employment and the organisation of workshops and manufactories in this country are not such as are favourable to the training of Indians in the artisan class:—

- (1) Unless such students are to remain throughout on the level of unskilled workmen (and this is clearly not the intention in awarding a technical scholarship), they must have received such an amount of instruction in mathematics, &c., as fits them for taking part in the more skilled operations of a factory; the level of such intellectual training demanded in engineering shops, electrical works, and factories of all kinds in this country, and actually attained by the better class of English workmen, is higher than that possessed by any skilled artisan in India; and it has been found necessary in the case of several of the technical scholars undergoing practical training to supplement such training by attendance at a Technical Institute, or by private lessons; such an arrangement implies waste of time and withdrawal of effort from the main purpose of the students coming here; e.g., it was proposed by the Government of India to award a scholarship for railway carriage and wagon building to Harendra Krishna Banarji, who had only read up to the level of the matriculation examination; such a student would be unable to calculate stresses and strains in structures without further study of mathematics and mechanics, and would not be permitted to

do the work done by skilled English workmen whose education had advanced to this degree.

- (2) The standard of academic attainment among skilled workmen in this country tends to rise, and recent legislation on education will bring this standard up to a still higher level. Even five years ago the Morison Committee found "that the rules in many firms now begin to show recognition of College training. In one firm whose rules were specially brought to our notice, there are no premium apprentices or pupils, but admission to the works is based on educational qualifications alone, and we understand that there are many firms of repute that make similar provision in their rules."

(Page 27.)

- (3) Manufacturers and leaders of industry in this country, with the exception of some electrical firms, and the chief engineers of some railway companies, do not as a rule undertake to train students in the particular branch of industry concerned, unless such young men intend to take permanent employment under this firm; they do not pretend to be educational establishments, but have in view only their own commercial advantage. Such practical experience as Indian students have hitherto been able to obtain has, in most cases, been gained through the intervention of some University Professor, who acts as an expert adviser to firms which are willing to admit his pupils for short periods of training in recognition of the advantage they gain from his expert advice. Even such opportunities are becoming more difficult to obtain, as was pointed out in the Report of the Morison Committee (page 38, section 67), where it is stated in reference to Glasgow that "it is growing more difficult to get our students into works, because of the great rapidity with which the engineering classes of the Glasgow University have increased of recent years."

These considerations point to the conclusion that students of the artisan class can in the majority of cases be more satisfactorily trained in India than in the United Kingdom, and such an opinion finds expression in several of the Enclosures to the Despatch of the Government of India (No. 5 of 1917, Department of Education). The Professor of Mechanical Engineering, College of Engineering, Poona, writes: "As regards facilities for practical experience in mechanical engineering, there are a number of large workshops in India where an adequate mechanical training can be obtained. This is true in a less degree of electrical engineering, but the facilities in this connection are sufficient to meet present Indian requirements. As regards other industries, I do not see why in most cases the necessary training should not be procurable in India. For instance, in the case of mining engineering, the report (i.e., the Report of the Morison Committee) shows very clearly that the necessary training could best be obtained in India" (Enclosure No. 2, page 4). The Principal of the College of Engineering "agrees with Professor Macmillan that all students should be trained in India, as far as possible, and thinks that technical students should only be sent abroad in very special cases, after they have been properly prepared for their work, as far as this can be done in India" (*Id.*, page 5). The Principal, Victoria Jubilee Technical Institute, Bombay, states that he does "not consider that there is any necessity to send men to England or elsewhere to take up textile work, mechanical engineering, electrical engineering, or civil engineering, but admits there may be in other subjects. The opportunities for a fairly advanced education and practical training already exist in this country to a very large degree, and might be made more use of than at present" (*Id.*, page 5), and adds (in a later letter): "It seems to me that the educational facilities for civil engineering in India are exceptionally good, and that the preliminary training given is all that is necessary. I am led to believe this from the very large number of Indians and others whose whole training has been obtained in this country, and yet have succeeded in filling satisfactorily

"the highest positions in this branch of engineering that are open in India. I am strongly of opinion that with the large engineering schemes of irrigation, railway extension and dock works, &c., the opportunities for practical employment in India are unequalled. Admitting that the present system of training in India is satisfactory, and that it has produced numbers of really good men, there only remains the practical experience to be provided for, and this is most difficult, except for those students who have secured guaranteed employment under Government. This practical experience can only be obtained in the various Departments of the Public Works, and I would suggest that the authorities of the various engineering colleges should, with the sanction of Government, apprentice their successful students with specially selected engineers of the Public Works Department, for a period of two years after completing their college course" (*Id.*, page 8). The Officiating Director of Industries, United Provinces, expresses the opinion, in regard to the textile industry, that "with the development of the textile course now being started at the Roorkee College, and with the facilities which should be possible to devise a system of training adequate to local requirements without sending State scholars to England." He lays stress on the difference in the nature of the raw material used in India from that employed in Lancashire, and concludes: "It would seem better, therefore, for the intending textile worker to obtain his practical training under conditions similar to those under which he will eventually have to work; during his technological course at Roorkee, arrangements could easily be made for him to obtain an adequate acquaintance with the most modern type of textile machinery in so far as this is adapted to the requirements of Upper India. . . . In conclusion, I would state that I am a firm believer in the general principles laid down by Sir Thomas Holland in connection with his remarks on instruction in mines, viz., "that technical education should, except in very rare cases, be given in India and not in Europe" (Enclosure No. 4, dated 18th October 1913, pages 3-4). The Officiating Chief Secretary to the Government of Bihar and Orissa, Education Department, states that "for the study of civil engineering ample facilities already exist in India, and for mechanical and electrical engineering the Sibpur College already has special classes, and, if these classes are replaced by the much greater facilities which it is proposed to offer in the Calcutta Technological Institute, there would be no need for students from the Provinces of Bihar and Orissa, Bengal and Assam to go to Great Britain for instruction in these subjects" (Enclosure No. 8, page 1, paragraph 4).

The above considerations combine to indicate that in the case of the three candidates mentioned in paragraphs 2 and 3 of the Government of India's Despatch, Messrs. J. K. Karani, P. I. Mathai and C. Pearce, more satisfactory results could be attained by a course of training in India, than in England. Mr. Mathai proposes to study plumbing and sanitary engineering; his educational qualifications are so low that for the study of the first subject he could only be put to work with a firm of plumbers in this country, where he would not have better opportunities than could be obtained for him in a similar firm in Bombay, Calcutta or Madras; the elementary examinations he has passed would not admit him to any but the lowest classes in Sanitary Engineering in any Technological School or College in this country, and as he is already 33 years of age, it cannot be expected that he will be able to cope with the severe course of study implied; on the other hand, no firm of sanitary engineers could provide anything but rudimentary training to a man whose knowledge of mathematics, physics, chemistry, &c., are confessedly so limited. Mr. J. P. Karani proposes to study Mechanical Engineering, but he has only passed the Matriculation Examination of the Bombay University, and with such a low standard of intellectual attainment it would not be possible to get him admitted to any works in this country as an A class apprentice, while the experience in a lower grade would be of no use to him; it must be remembered that as there are now 17 Universities in the United Kingdom, in addition to

numerous Technical Schools and Colleges,—many of which are situated in the large centres of industry,—manufacturers and others can obtain for their works men whose educational attainments are of a high level, and it would not be possible for Mr. P. I. Mathai or Mr. J. F. Karani to be associated with such men in the skilled work that is entrusted to their care, as they would be incapable of understanding the scientific principles underlying such operations, a knowledge of which is taken for granted in the case of the workmen referred to. As the supply of well-educated young men tends every year to increase, the managing directors of works are raising their demands in regard to the academic qualifications of those they admit as apprentices or for any period of practical training; and the advanced age of the two candidates proposed precludes the possibility of their attaining such a degree of theoretical knowledge in any reasonable amount of time. A protest may here be entered against the award of Technical Scholarships, to be held in this country, to men of such advanced age; it is found (as in the case of Mr. O. L. Dalton, who received his scholarship at the age of 29) that having intermitted the habit of academic study for a considerable period, they are not capable of keeping level with the work of any ordinary class, or of taking full advantage of the instruction that is given to them. Mr. C. Pearce (aged 24½) is younger, but as the standard of his education is also low he would derive more advantage from a scholarship to be held in India with the possibility of further training at Lilloah or in the carriage and wagon workshops of some other of the great railway companies in India, than from a training in this country, which from the circumstances of the case implies a more thorough preliminary education at school and college.

READ AGAIN G.O. No., dated 191 .

" " " " 191 .

READ ALSO:—

C. No. 534, From the Secy to the Govt of India, No. 123, dated 19-2-1918.

" " " " 191 .

" " " " 191 .

ORDER.

No. 290, dated 28-2-1918.

Miss

communicated to the D.P.I
for information and guidance.

25-2-18
JL
26-2-18

27-2-18
CA
20/2/18

To the D.P.I (ato)

Spent 1/3/18

Note:— Mr Mathai's application
for the award of the Scholarship in
the current year has been forwarded
to the D.P.I

25-2-18
JL
26-2-18

CA

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