GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

Read—the following paper :—

From H. B. GRIGG, Esq., M.A., Director of Public Instruction, to the Acting Chief Secretary to Government, dated Madras, 25th August 1883, No. 5909.

With reference to G.O., dated 21st June 1882, No. 101, Educational, I have the honor to submit three copies of the report on the Civil Engineering College for 1882-83, together with my review of the same.

Enclosure.

Proceedings of the Director of Public Instruction, dated 10th August 1883, No. 5513.

Read the following letter from Lieutenant H. D. LOVE, R.E., Principal, Civil Engineering College, dated 29th May 1883, No. 250-C.

I have the honor to submit the following report on the working of the Civil Engineering College during the past year, and on the results of the examinations for certificates which have been held in that period.

2. *Changes in Establishment.*—Owing to the absence, on furlough, of Mr. Bradshaw, Mr. Kenny continued to act as First Assistant Master throughout the year.

Consequent on the absence, in England, of Mr. McAleese at the commencement of the Session in August, Mr. W. Cames acted as Second Assistant Master, Storekeeper and Librarian; Mr. W. Hyde as Third Assistant Master and Instructor in Photography; and Mr. J. Hamilton as Fourth Assistant Master, Mr. J. B. Hennessy taking charge of the Drawing Class in addition to his own duties.

On 1st November 1882, Mr. McAleese, Second Assistant Master, returned from furlough, and the masters junior to him reverted to their substantive appointments.

On 17th January 1883, Mr. J. B. Hennessy was appointed temporarily to the Public Works Secretariat, and Mr. F. Pope was transferred from that office to the college.

On 2nd March 1883, Sub-Conductor W. J. McAleese was transferred to the Military Department, and the following appointments were made :—

Mr. W. Cames to be Second Assistant Master, Librarian and Storekeeper.
Mr. W. Hyde to be Third Assistant Master and Instructor in Photography.
Mr. J. Hamilton to be Fourth Assistant Master, sub. *pro tem.*
Mr. F. Pope to be Fifth Assistant Master, sub. *pro tem.*

The services of Mr. J. Campbell of the Public Works Department have been applied for as Sixth Assistant Master, sub. *pro tem.*

It will be observed that, during the greater part of the year, the staff has been one under its full complement. Considerable extra work has consequently devolved on Messrs. Hyde and Hamilton, the Instructors in Surveying and Drawing.

3. *First Department—Engineer Classes.*—This department contains eight students in the first division, and thirteen in the second—in all twenty-one—the largest number of which it has ever consisted. As several of the students are already Graduates in Arts, it appears probable that these classes will do themselves and the college credit in the examinations for certificates as Assistant Engineer, which will be held in this and the following years, as well as in the corresponding University Examinations for the degree in Civil Engineering. In December 1882, no first division existed, and consequently no students appeared from the college for the last degree examination. The students of the second division, however, passed a satisfactory sessional

examination, and were all promoted to the first division. In the following January, the number of applications for the senior department was unusually large, and thirteen students were admitted. The present popularity of the first department appears to be due partly to the appointments made by the Public Works Department in 1881 to the grade of Apprentice Supervisor, and partly to the extended field for employment which is now furnished by Local Fund Boards and Municipalities.

4. *Second Department—Subordinate Classes.*—In the first class of this department, ten students have just undergone examination for certificates of qualification as Overseer, Public Works Department. These men joined the college two years ago at a time when the popular alarm caused by reductions in the Public Works Department had not subsided, and when confidence in the immutability of that branch of the public service had not been restored. The number of applicants for admission to the college was therefore small; but their quality, judged by the results of the recent examination, is nevertheless above the average.

5. I take this opportunity to express my grateful thanks to the following gentlemen, who have been so good as to serve as Examiners:—

Arithmetic	
Algebra	Lieutenant-Colonel A. F. Hamilton, R.E.
Euclid	Lieutenant H. Andrews-Speed, R.E.
Mensuration	Captain J. S. S. Barker, R.A.
Trigonometry and Statics	Colonel H. L. Prendergast, R.E.
Building Materials and Construction	A. S. Russell, Esq.,
Earthwork and Road-making	C. Vincent, Esq., A.I.C.E.
Bridges and Irrigation Works	Colonel R. B. Kennedy, S.C.
Hydraulics	Lieutenant-Colonel C. J. Smith, R.E.
Strength of Materials	Captain W. H. Coaker, R.E.
Chain, Compass, and Sextant Surveying	F. B. Hanna, Esq., M.A., M.E.
Levelling	Captain G. Henry, R.E.
Traversing with Theodolite	P. Scott, Esq., M. Inst. C.E.
Drawing from Specification	Lieutenant R. E. Hamilton, R.E.
Estimating	G. Bayly, Esq., B.A.
Tamil and Telugu	Major R. R. E. Drake-Brockman, R.E.
	M.R.Ry. V. Krishnamachariyar Avargal.

6. The following extracts are made from the reports of Examiners:—

Arithmetic.—Colonel Hamilton says:—"This paper has been answered very well, as shown by the high average marks obtained, only one student failing to get three-quarter marks."

Algebra.—Mr. Andrews-Speed writes:—"On the whole, I consider the papers very fair."

Euclid.—Captain Barker reports:—"The papers are decidedly good."

Mensuration.—Colonel Prendergast states that "the candidates have done the Mensuration paper well, although it was a stiff one."

Trigonometry and Statics.—Mr. Russell reports that "the general average is good."

Building Materials and Construction.—Mr. Vincent writes:—"I cannot say more of the majority of answers than that they are fair."

Earthwork and Roads.—Colonel Kennedy says:—"With the exception of the first four in the list, I cannot consider that the candidates have acquitted themselves at all creditably."

Bridges and Irrigation Works.—Colonel C. J. Smith writes:—"There is little to choose between the first three men; their papers are excellent, neatly and quickly written, well expressed and neatly illustrated. I consider the replies on the whole very good."

Hydraulics.—Captain Coaker reports:—"The results are good, the average marks gained being 65 per cent. The students possess a good knowledge of formulæ; but some examples are clumsily worked out."

Strength of Materials.—Mr. Hanna makes no remark.

Chain, Compass, and Box Sextant Surveying.—Captain Henry observes that "the results generally are more satisfactory than in previous years, and afford evidence of good instruction."

Levelling.—Mr. Scott remarks that "the results are most satisfactory, and show that the students are all well grounded in the subject."

Traversing with the Theodolite.—Mr. Hamilton states that "the result of the examination is satisfactory."

Drawing from Specification.—Mr. Bayly reports that "the drawings are in general neat and satisfactory."

Estimating.—Major Drake-Brockman writes:—"The plan was designed to test the abilities of the candidates in as varied a manner as possible. Three out of the ten examinees grasped the easiest method of taking out the quantities, and two failed to get more than 10 per cent. of the marks."

Language.—Mr. Krishnamachariyar states that "the result of the examination may be regarded as tolerably fair."

7. Comparing, as was done last year, the results of the examination with those of 1881, a suitable year for comparison, it will be found that there has been—

A rise of 2 per cent. in Mathematics.
A rise of 7 per cent. in Engineering.
A rise of 6 per cent. in Surveying.
A rise of 9 per cent. in Drawing.
A rise of 10 per cent. in Language.
A rise of 9 per cent. on the total.

The improvement is partly due, I consider, to slight unintentional relaxation of the usual standard on the part of one or two of the examiners, but chiefly to the exceptional merit of the five men who stand highest on the list. The results reflect credit on the instructional staff.

8. All ten candidates passed. Five obtain certificates as Supervisor, Public Works Department, having gained not less than 35 per cent. of the marks in each subject and 60 per cent. of the total; and the remainder secure certificates as Overseer, Public Works Department, the qualification for which is 25 per cent. on each subject and 40 per cent. of the total.

Gunner Coghlan, R.H.A., stands first with 1,890 marks out of 2,500. He obtains a certificate as Supervisor and gains the Royal Engineer Officer's prize for distinguished Proficiency, and the prize for Drawing. He receives special mention from the Examiners in Arithmetic, Euclid, Bridges and Irrigation Works, Traversing, Drawing from Specification and Estimating.

Gunner Alford, R.A., occupies the second place with 1,860 marks, taking a Supervisor's certificate, and obtaining the prize for Surveying and that for Language. He receives special mention from the Examiners in Euclid, Trigonometry and Statics, Levelling Bridges and Irrigation Works, and Estimating.

H. Subba Rao stands third with 1,852 marks. He secures a Supervisor's certificate, obtains the prize for Mathematics and that for Engineering, and receives special mention from the Examiners in Algebra, Euclid, Trigonometry and Statics, and Bridges and Irrigation Works.

A considerable gap occurs between these three men and C. H. Edwards and M. P. Narasimha Aiyangar, who occupy the fourth and fifth places with 1,716 and 1,708 marks respectively. Both have gained certificates as Supervisor, and both have received special mention from several of the examiners.

Between the fifth and sixth men there is a gap of upwards of 300 marks. The following students occupy places ranging from sixth to tenth, and have all been successful in securing certificates as Overseer:—

N. Venkatadri.	D. G. Thomas.
A. Ramamurti.	P. Duncan.
M. Aiyannah Nayudu.	

9. The second class of this department contains twenty students, nineteen of whom have recently undergone a satisfactory examination. The whole of the pupils have been promoted to the first class.

V. R. Venkatarama Aiyar stands first with 1,045 marks out of 1,400, and gains the prize for Mathematics, and a scholarship of Rs. 15 *per mensem*. S. L. Abraham takes the second place with 1,009 marks, gaining the prizes for Surveying and Drawing, and a scholarship of Rs. 15 *per mensem*.

Driver Huson occupies the third place and secures the prizes for Engineering and Language. To the next three men—T. S. Venkatesvariah, T. Krishnaji Rao, and C. Murugesa Mudaliar—are awarded scholarships of Rs. 15 each *per mensem*. The rest of the class have done very fairly.

10. *Drawing Class.*—The first division of eight students has done exceedingly well. G. Ellis stands first with 427 marks out of 500, and M. Embaraya Nayudu second, with 422. Both these men secure the distinction of first-class certificates, the prize being awarded to Embaraya Nayudu owing to his senior having spent more than two years at the college. The next two men—K. Sadagopa Mudaliar and P. Sundararamanjulu Naidu—obtain second-class certificates, and the remaining four men, third-class certificates. These results are creditable to the instructor Mr. Pope.

11. In the second division, the three students who have been examined are promoted to the first division. None of them, however, have done sufficiently well to justify the award of a scholarship.

12. Candidates other than college students, to the number of forty, have also undergone examination for certificates as draftsman. The majority of these are employed in the Public Works Department, and appear for the examination with the view of obtaining a higher class of certificate than they already possess. The results of the examination are not yet known.

13. *Surveying Class.*—The first division, comprising three students, has been examined for certificates. R. Sivasubramania Aiyar has done very well, obtaining the prize and a first-class certificate. M. A. Muthu Pillai secures a third-class certificate, and the remaining member of the class, who has failed, will be permitted to study for another year in the college.

14. The second division of five students, four of whom have recently undergone examination, has done fairly. A scholarship of Rs. 8 *per mensem* is awarded to A. Periasawmi Pillai who occupies the first place on the list.

15. A larger number of students might, with advantage, join both the Drawing and Surveying classes, especially the former. The maximum pay of a first-class draftsman in the Public Works Department has now been raised to Rs. 100 per mensem, and the demand for qualified men is in excess of the supply. The pay of the lower grades is, however, still small, and I fear that little improvement in the general attainments of candidates for the college entrance examination for this class can be expected until the condition of these grades has been ameliorated.

16. The number of applicants for admission to the Survey class is not large, and their attainments are usually inferior. It is hoped that a proposal, which has been made to create a graded list of Surveyors for the Public Works Department, will be carried out, as the fact that employment is generally of a temporary nature is one of the causes of the unpopularity of this class of the college.

17. *Photographic Class.*—This class consists of twelve students selected from the second and special departments of the college. Creditable work has been done with wet plates; and the instructor, Mr. Hyde, is now introducing the dry plate process which has already almost superseded the older system.

18. *Military Students.*—The session commenced with five students—three in the first-class of the second department and two in the second. Of the former, one was compelled to revert to his battery on account of ill-health.

Four men in the vernacular class at Bangalore are about to be examined in Language for entry to the college in August next.

Eight non-commissioned officers and men qualified at the entrance examination in April last, and the first five of these will join the vernacular class early in June.

19. *Employment—First Department.*—Up to the present time, the profession of Engineering has not been a popular one among natives. As to the cause of its unpopularity, there can be no uncertainty. To call into and maintain in existence a novel profession in this country, encouragement must first be given by Government, and reasonable prospect of employment must subsequently be held out. Excepting the advantage of a cheap education, both these conditions have, as regards Civil Engineering, been wanting until very lately. The fact that during the seventeen years following the formation of the Engineer class at the college, only two appointments of natives were made to the Engineer establishment of the Public Works Department, speaks to the absence of both the conditions of success, since the Public Works Department was, during that period, the chief, almost the sole, employer of the Civil Engineering profession. Efforts, extending over several years, were made to obtain a guarantee for the employment of at least one student annually of the Engineer class, but without success. To show that encouragement is all that is wanted to make Civil Engineering popular, it need only be said that in 1881, after three years had elapsed with but a single appointment conferred by the Public Works Department, and when the number of students in the senior class had, in consequence, become diminished to one, five nominations (of previously passed men) were made to the new grade of Apprentice Supervisor with the result that the following session commenced with eight students and the succeeding one with thirteen—the numbers at present occupying first department.

20. There now appears to be every prospect that the encouragement thus afforded will be continued and extended. From a notification in the *Fort St. George Gazette* of 27th February, it will be seen that the Government of India propose reserving certain appointments to the Engineer establishment of the Public Works Department for the different Civil Engineering Colleges of India. Should this proposal be carried out, the allotment to Madras would probably be one appointment per annum, commencing with the year 1885. As an alternative measure, it has been suggested that nominations from the college should be made to the rank of Sub-Engineer at the rate probably of two per annum, and that the annual appointment to the superior establishment should be conferred only after long and approved service. The first of these alternatives would doubtless be the more acceptable to present and prospective students of the first department; but, whichever is ultimately adopted, an impetus will be given to the acquirement of engineering knowledge, of which the results to the natives of this presidency can scarcely be over-estimated.

21. When it is considered that lack of encouragement and difficulty of obtaining employment have hitherto been the obstacles which have prevented natives from taking full advantage of the engineering instruction held out to them, and when it is further borne in mind that, owing to the policy of decentralization and the extension of the principle of local self-government, the general prospects of employment are now unusually good, it is not difficult to realise that the future, which is opening to the senior classes of the college, should form an emphatic contrast to the past.

22. I have heard fears expressed that the native of India is not likely to make a good Public Works officer. The answer is to point to Northern India, where, according to the Public Works Classified List, corrected to 31st December 1881, there are 58 natives in the Engineer establishment, viz., 10 executive engineers and 48 assistant engineers. These figures prove that the appointment of natives has not been a failure; and I do not believe that natives of this Presidency will show themselves in any way inferior to those of Northern India.

23. When the requisite encouragement has been afforded in the manner described, there will be no difficulty in increasing the length of the course, so as to afford that practical training without which no man can become a useful engineer. The desirableness of such training, being imparted to *all* students, whether destined for the Public Works department, or not, has been recognised by the Government in their Proceedings, No. 3057 W., dated 18th November 1882, and the question has been referred to the Committee on the Civil Engineering College to which allusion has been made in recent annual reports. The Committee submitted a further report in the early part of the present year, and it is hoped that orders will now shortly be passed on the important matters which are there dealt with.

24. *Second Department.*—As in the first department, so in the second, the appointments to the Government service are regarded as the chief prizes of a successful course of study. To stimulate competition at the entrance examination, and thus to secure a superior class of students, it is essential that comparative uniformity should be preserved in the number of appointments conferred annually, and that no year should, if possible, be allowed to elapse without some, if only a very few, nominations being made at the close of the college session. The results of neglect of this consideration make themselves felt three or four years after the causes arise, and the Public Works department may thus experience difficulty in obtaining a sufficient supply of suitable men long after changes have been made which affect the influx of candidates to the college. Thus it is immediately traceable to the extensive reductions which were made in the Public Works department in the years 1879 and 1880, that the number of students passing out of the college overseer class in 1882 was only seven, and that in the present year it is only ten. The gradual restoration of public confidence will be recognised by the fact that in 1884, the number will rise to about twenty, and in 1885 to thirty or even more. Had Local Fund boards possessed in 1879 their present engineering establishments, the numbers I first quoted could not have fallen so low; but making every allowance for extended prospects of employment outside the Government service, it seems to me that it would be advantageous in every way if the Public Works department could arrange to appoint a certain minimum number of apprentice overseers annually. Under G.O., No. 2733 W., dated 4th November 1881, the maximum number is fixed at ten. It is believed that the upper subordinate establishment of the Public Works department is, at this moment, in excess of its normal strength; but I trust that it may be found possible shortly to nominate to the public service a few of the civilians now passing out in addition to the two military students who are guaranteed employment by the rules under which they entered the college.

25. The chief desideratum for the second department is that *all* its students should undergo a practical course on works, so that they may become serviceable overseers when permanently appointed to an establishment. The College Committee have laid stress on this point.

26. *Surveyors and Draftsmen.*—These men are appointed, as required, by Superintending and Executive Engineers in the Public Works department, and by other officers in want of their services. It is not possible, therefore, to furnish precise statistics of the numbers employed during the year. Efforts are made to induce the men to communicate particulars regarding themselves; but there exists an unwillingness to do so, which is probably due to a fear that a man known to be employed might fail to be recommended for the vacancies which are from time to time referred to the college.

27. To become aware that present prospects of employment generally are good, it is only necessary to refer to the public press, where advertisements for engineers, for supervisors, overseers, surveyors, and draftsmen are of frequent occurrence. With the view of assisting students and their friends, these advertisements are collected and posted at the college. In addition, applications from officers for the services of passed men are occasionally received, and recommendations are made to them. In response to such requests, seven overseers, seventeen surveyors, and fifteen draftsmen have been recommended during the year; and I have no doubt that the services of a fair proportion of these have been retained.

28. Allusion was made in last year's report to the fact that the engineering establishments of the Local Fund boards contained many individuals who would not be eligible for corresponding positions in the Public Works department. It is hoped that the recommendations of the Local Self-Government Committee, which has been sitting during the year, will result in the employment of uncertificated men being prohibited.

29. *Model Room.*—Several useful models have been added to the collection. Chief among them are—

A plate girder bridge (admirably constructed in zinc under the supervision of Mr. E. W. Stoney of the Madras Railway).
Working models of Stoney's excavators.
Pile-driver.
Apparatus illustrating shearing stress in beams.
Four model steam engines (from Public Workshops, Dowlaishweram).

30. *Library.*—During the year under review, 56 works have been added to the library, making a total of 1,580 volumes. The library is now freely utilized, 931 books having been issued to masters and students, as against 290 in 1880-81, and 647 in 1881-82.

31. It has not been found possible to effect any development of physical training for the students. This question is one of the numerous matters which must await the passing of final orders on the College Committee's report.

32. The conduct of the students has been uniformly good, and their attendance regular. I trust that the relaxation of the coming vacation will enable both them and the staff to return to their duties with fresh vigor at the commencement of the ensuing session.

There were not many changes in the staff during the year. Mr. McAleese was transferred to the Military department in March last, and on the occasion of the two temporary vacancies which preceded this transfer, a re-arrangement of the work among the existing staff was effected in one case, and Mr. Pope was brought in in the other. The Principal's remark that "during the greater part of the year the staff has been one under its full complement," is not understood. The remark would seem to apply only to the short period that Mr. McAleese was absent on furlough, viz., from the commencement of August session to 31st October 1882.

2. *First Department.*—The Director is glad to observe that the first department is becoming more and more popular every year. The first and second divisions had eight and thirteen pupils respectively, while in 1881-82 there were no students in the first class, and only nine in the second—a number which was said to be the largest attained for many years. Very good results are expected from the fact of several of the students being already graduates in arts. The fact that graduates in arts are entering college is a most hopeful feature in the year's report, as it indicates that classes of natives of Madras who have not hitherto taken to engineering as a profession are, in the present demand among graduates in arts, for suitable employment, tending to do so now. The Director is persuaded that the time is not far distant when it will be possible to secure for even the lower subordinate establishments men who have added to a degree in arts, a degree in civil engineering, as the remuneration granted in the lower subordinate establishment is, on the whole, more favorable than that attainable in several departments to which graduates now flock. To render this change, however, an unmixed benefit to the great employers of engineering labor in this country, it is essential that such men, by the time they leave the institution, shall have obtained not merely a good theoretical but also a thoroughly practical knowledge of the mechanical and industrial arts which it will be their duty to guide and exercise. The Principal does not name the classes of the community to which the students belong, but from the returns it appears that, as contrasted with 1881-82, the figures are as follow for all departments :—

	1881-82.	1882-83.
Europeans and Eurasians	11	11
Brahmans	11	33
Hindus (not Brahmans)	17	15
Native Christians	9	7
Muhammadans	..	1
Others	3	3
Total ..	51	70

The absence of any students in the first division last year accounts for the college not having sent up any students for the last B.C.E. Degree Examination. The Director trusts that the impetus given by the admission of natives to the grade of apprentice supervisor and the prospect of employment afforded by Local Fund boards and Municipalities will conduce to the department improving in strength and supplying candidates for the B.C.E. degree hereafter.

3. *Second Department.*—There were (10) ten students in the first class of this department, who all underwent examinations for certificates as overseers. Five obtained certificates as

supervisor, Public Works department, and the remaining, certificates as overseer. The results of the examination were, on the whole, good, and the five men who head the list are said to possess exceptional merit. In "Earth-work and Roads," the results were poor, and "Building Materials and Construction" only moderate. The partial failure in these two practical subjects, as against the almost uniform success in those of more theoretical character, is noted. Compared with 1881, in some cases marked increase appears in the average percentage of marks obtained in the several subjects, but "the unintentional relaxation of the usual standard on the part of one or two of the examiners," is noted by the Principal as one of the causes of this improvement :—

Mathematics	Increase	2 per cent.
Engineering	„	7 „
Surveying	„	6 „
Drawing	„	9 „
Language	„	10 „
Total Increase ..		9

The strength of the class would have been greater but for the panic caused by the reductions in the Public Works department two years ago, when these students entered the college. Now that it has subsided, greater numbers are expected to enter the college.

4. The second class was twenty strong. Nineteen of these are reported to have passed a fair examination and all twenty have been promoted to the first class. The circumstances under which one of the number did not undergo examination and yet obtained promotion should have been explained. The first six students are said to have acquitted themselves very creditably at the examination, but only five obtained scholarships. Driver Huson occupied the third place and obtained prizes for engineering and language. He does not appear to have been awarded a scholarship, although the three who stand below him obtained one each.

5. *Drawing Class.*—The numbers in the two divisions show decline—

	Present strength.		
First division	8	against 10	in the preceding year.
Second do.	3	do. 5	do. do.

A marked improvement appears in the first division, to having secured first-class certificates, two second class, and four third class. These results are very creditable. Two of the pupils appear to have had more than two years' training.

The results of the second division are disappointing. None of the three forming the class succeeded in securing a scholarship.

The Drawing Class Examination was open also to candidates other than college students. There were forty of these. The results of their examination are not known.

6. *Surveying Class.*—The first division consisted of only three students, who have been examined for certificates. One obtained a first class, another a third class, and the third failed. The second division, with five students, did fairly at the examination.

7. Regarding the poor strength of the drawing and surveying classes, it is remarked that the pay of the lower grades of draftsmen is still small; and until their condition is ameliorated, improved attainments in this class, or increase of numbers, cannot be looked for. If a proposal to create a graded establishment of surveyors for the Public Works department is carried out, this department will doubtless improve in number and in the calibre of the students. A photographic class was formed during the year of twelve selected students of the college. Creditable work is reported to have been done with wet plates, and the dry plate process is now being introduced.

8. *Military Students.*—There were three students in the first class of the second department and two in the second, when the session commenced. Ill-health compelled one of the former to return to his battery.

In the vernacular class at Bangalore, four men were expected to pass in language, with the object of joining the college in August, eight non-commissioned officers and men passed the entrance examination in April, and five of these were expected to join the vernacular class in June. The reservation to military students of a considerable portion of the openings annually available in the Departments of Public Works must unquestionably prejudicially affect the progress of education in engineering and kindred subjects among the natives of the Presidency, however necessary such reservation may be to the interests of the department itself.

9. *Employment of Passed Students.*—The Principal has forcibly explained the causes which have prevented natives from taking full advantage of the engineering instruction given to them, and the gradual increase from 1881 is pointed out. The notification of the Government of India proposing to reserve certain appointments to the engineer establishment of the Public

Works department for the different Civil Engineering Colleges of India will, with the policy of decentralization and local self-government, doubtless tend to enlarge the prospects of employment to the college students; but the Director is persuaded that the institution, in all its branches, will never take its proper position in the educational scheme of the country, until it ceases to educate men for a few reserved Government appointments, but has, instead, the permanently assured prospects of admission to the subordinate ranks of the Public Works department by means of some system of open competition.

10. It is reported that seven overseers, seventeen surveyors, and fifteen draftsmen have been recommended for employment to various departments.

11. The model room and the library have received valuable additions during the year.

12. As to development of physical training of the students, the Principal reports that it has not been found possible to effect any arrangements. The Director does not understand what difficulty there is in doing so, and why final orders on the College Committee's report should be awaited before taking action in the matter.

(A true Copy and Extract.)

(Signed) H. B. GRIGG,
Director of Public Instruction.

To the Principal, Civil Engineering College.

Order—dated 1st October 1883, No. 652, Educational.

Ordered that the report be forwarded to the India office.

(True Extract.)

E. F. WEBSTER,
Acting Chief Secretary.

To the Director of Public Instruction.
„ Public Works department.

Exd. J. Wright.

Govt. of {1883} Madras.

EDUCATIONAL.

Issued

Recd. *Encl.*

G.O., 1st October 1883, No. 652.

B. No. 3021/W. 24-10-83.

Recorded

OCTOBER.

Civil Engineering College.

Forwarding to the India office report on the working of the — during the year 1882-83.

GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

READ—the following paper :—

From H. B. GRIGG, Esq., M.A., Director of Public Instruction, to the Chief Secretary to Government, dated Madras, 9th August 1884, No. 5398-A.

In forwarding the enclosed copy of my review of the annual report of the Civil Engineering College, I beg to request the special attention of Government to paragraphs 6, 8, 13, 16, 20 and 21.

ENCLOSURE.

PROCEEDINGS of the Director of Public Instruction, dated 31st July 1884, No. 5162-A.

Read the following letter from the Principal, Civil Engineering College, to the Director of Public Instruction, dated 30th May 1884, No. 277-C :—

I have the honor to submit the following report on the working of the Civil Engineering College during the past year, and on the results of the examinations for certificates which have been held during that period.

Enclosure 1 (Results of first class, second department).

2. *Changes in Establishment.*—Owing to the absence on furlough of Mr. Bradshaw, Mr. Kenny continued to act as first assistant master throughout the year. On 30th July 1883, Mr. J. C. Campbell joined the college from the Public Works department. He was appointed sixth assistant master sub. *pro tem.*, and assumed charge of the surveying class. Since that date the staff has been at its full strength.

3. *Numbers.*—The numbers on the rolls this day are—

First department	21
Second do.	46
Special do.	25
Total ..	92

The numbers arranged according to classes of the community are—

Europeans and Eurasians	20
Brahmans	41
Hindus (not Brahmans)	19
Native Christians	9
Muhammadans	1
Others	2
Total ..	92

4. *First Department—Engineer Classes.*—In December 1883, the senior division contained eight students. Of these, seven presented themselves for final examination, the eighth, R. Nageswara Aiyar, being unfortunately prevented from appearing. Six obtained certificates as assistant engineer, viz. :—

K. Krishnan Nayar, B.A.,
S. I. Vaikuntam Aiyar, B.A., } with honors.
R. V. Narayana Aiyar,
A. G. Umamen,
A. R. Natesan, B.A.,
T. Bhavani Sankara Sastri,

and one, S. G. Krishnasawamy Aiyar, a certificate as overseer.

5. I take this opportunity of expressing my acknowledgments to the following gentlemen, who kindly set papers for the examination :—

Arithmetic	Major Sidney Smith, R.E.
Algebra	Rev. W. Leeming, M.A.
Euclid	Lieutenant H. Andrews-Speed, R.E.
Mensuration	Colonel H. L. Prendergast, R.E.
Trigonometry	C. Vincent, Esq., A.M., INST. C.E.
Statics and dynamics ..	M.R.R. S. Rangayya Chettiyar Avargal, B.A.
Building materials and construction	Major C. Bowen, R.E.
Earthwork and road-making	Lieutenant-Colonel W. H. Burton, R.E.
Bridges and Irrigation works	E. W. Stoney, Esq., M. INST. C.E.
Hydraulics	A. S. Russell, Esq.
Practical mechanics ..	Captain W. L. C. Baddeley, R.E.
Hydrostatics and pneumatics	M.R.R. P. Runganadha Mudaliar Avargal, M.A.
Theory of stresses and strength of materials ..	F. B. Hanna, Esq., M.A., M.E., M. INST. C.E.
Chain, compass and sextant.	H. J. Thompson, Esq.
Levelling	Lieutenant-Colonel A. F. Hamilton, R.E.
Theodolite and traverse ..	Lieutenant R. E. Hamilton, R.E.
Drawing from specification .	Major J. L. L. Morant, R.E.
Estimating	Major R. R. E. Drake-Brockman, R.E.

6. In January 1884, the eight members of the class appeared for the B.C.E. Degree examination of the University. The five following were successful :—

K. Krishnan Nayar, B.A.	*First class*
S. I. Vaikuntam Aiyar, B.A.	*Second class*
R. V. Narayana Aiyar	
R. Nageswara Aiyar, B.A.	*Third class.*
A. R. Natesan, B.A.	

This result is very gratifying, especially as the distinction of a first class has been attained in only one previous case since the foundation of the college.

7. The present senior division consists of ten students, and the junior of eleven. They have just undergone a sessional examination, at which satisfactory progress has been indicated. Prizes are awarded as follows :—

First Division.—Mathematics	..	S. A. Subramania Aiyar, B.A.
Do. Engineering	..	S. A. Subramania Aiyar, B.A.
Do. Surveying	..	M. Ramakrishna Aiyar.
Do. Drawing	..	K. R. Rangasawmi Aiyangar.

Second Division.—To R. A. Srinivasa Aiyangar, B.A., as the most proficient student.

The popularity of the first department has of late increased in a very marked manner. At the commencement of the session in January last, upwards of thirty applications for admission were received. The accommodation and teaching capacity of the college, as well as the prospects of employment, render it undesirable, however, to admit more than 10 or 12 candidates per annum.

8. *Second Department—Subordinate Classes.*—The first class of this department contains 20 students. Nineteen of these have just undergone examination for certificates of qualification as supervisor and overseer, Public Works department, one man being prevented by sickness from appearing.

9. I have to express my grateful thanks to the following gentlemen who have been so good as to serve as examiners :—

Arithmetic	Major Sidney Smith, R.E.
Algebra	Lieutenant H. Andrews-Speed, R.E.
Euclid	Captain J. S. S. Barker, R.A.
Mensuration	Colonel H. L. Prendergast, R.E.
Trigonometry and statics ..	Captain W. L. C. Baddeley, R.E.
Building materials and construction of buildings ..	Major C. Bowen, R.E.
Earthwork and road-making .	J. A. Jones, Esq., M. INST. C.E.
Bridges and Irrigation works	Lieutenant-Colonel C. J. Smith, R.E.

Hydraulics	Lieutenant-Colonel H. M. Vibart, R.E.
Strength of materials ..	F. B. Hanna, Esq., M.A., M.E., M. INST., C.E.
Chain, compass and sextant..	H. J. Thompson, Esq.
Levelling	Lieutenant-Colonel A. F. Hamilton, R.E.
Theodolite and traverse ..	Captain R. E. Hamilton, R.E.
Drawing from specification ..	Major R. R. E. Drake-Brockman, R.E.
Estimating	Major J. L. L. Morant, R.E.
Language	M.R.R. V. Krishnamachariar Avargal.

10. The following are extracts from the reports of examiners :—

Arithmetic.—Major Sidney Smith says :—"The result on the whole is good, showing care, combined with rapid working."

Algebra.—Mr. Andrews-Speed writes :—"The candidates show a good knowledge of the subject."

Euclid.—Captain Barker reports :—"The majority of the papers appear to me to be extremely good. The candidates have been well grounded in the subject, and have shown considerable intelligence in their answers."

Mensuration.—Colonel Prendergast states that "The paper of questions was somewhat long and difficult ; but the first seven candidates have written good answers."

Trigonometry and Statics.—Captain Baddeley reports that "Three only of the papers are good ; the remainder are not up to the average of previous years."

Building Materials and Construction.—Major Bowen says :—"The answering of the first five men has been good, and that of the next five, fair."

Earthwork and Roads.—Mr. Jones writes :—"I find that in many cases extremely hazy ideas prevail on such subjects as the calculation of volumes of earthwork, the setting out of curves, &c."

Bridges and Irrigation Works.—Colonel C. J. Smith observes that "The class on the whole did well."

Hydraulics.—Colonel Vibart says :—"I consider the results very fairly satisfactory."

Strength of Materials.—Mr. Hanna writes :—"The class appears to have attained the average standard for the last few years."

Chain, Compass and Sextant Surveying.—Mr. Thompson states that "On the whole the results may be considered very fair."

Levelling.—Colonel Hamilton remarks that "The results are very good, the average being as high as 79 per cent."

Traversing with Theodolite.—Captain Hamilton says :—"The replies have not been so satisfactory as at former examinations."

Drawing from Specification.—Major Drake-Brockman reports that "The students have done fairly well."

Estimating.—Major Morant observes that "Taken as a whole, the result is good, but I think the neatness of the estimates might be improved."

Language.—Mr. Krishnamachariar writes that "The results are satisfactory in the case of the Tamil, and tolerably fair in that of the Telugu students."

11. Comparing the results of the examination with the average of the last five years, it will be found that there has been—

a rise of 6 per cent. in Mathematics,
no change in Engineering,
a rise of 3 per cent. in Surveying,
a rise of 14 per cent. in Drawing,
a rise of 4 per cent. in Language,
a rise of 6 per cent. on the total.

The average of the five years referred to is somewhat low, owing to the inclusion in that period of a season of depression in the Public Works department, which rendered competition for the college less acute. The general improvement now apparent is due to a class of young men of better general attainments having come forward as candidates for the institution. The marked rise in the drawing average is, however, in great measure the result of special pains taken by Messrs. Hyde and Hamilton to advance this branch of instruction.

12. All the candidates have passed. Eight obtain certificates as supervisor, Public Works department, having gained not less than 35 per cent. of marks in each subject and 60 per cent. of the total, and the remainder secure certificates as overseer, the qualification for which is 25 per cent. in each subject and 40 per cent. of the total.

V. R. Venkatarama Aiyar stands first on the list with 1,864, out of a possible total of 2,600 marks. He obtains a certificate as supervisor, and gains the Royal Engineer officers' prize for distinguished proficiency, and the prize for mathematics.

T. Krishnaji Rao occupies the second place with 1,797 marks. He gains a supervisor's certificate, and the prize for vernacular language.

S. L. Abraham stands third with 1,782 marks, taking a supervisor's certificate and prizes for surveying and drawing.

The following have also secured certificates as supervisor, one of them, R. Subramania Aiyar, who stands seventh on the list, having gained the prize for engineering :—

Driver E. Huson,	R. Subramania Aiyar,
T. S. Venkateswara Aiyar,	C. Murugesa Mudaliar.
T. Peraiyah Nayudu,	

The above students have received special mention from many of the examiners.

13. The prize for vernacular language has hitherto been awardable only to Europeans or Eurasians, as the natives were examined in their mother tongue. Two years ago, however, it was ordained that the natives of the class should study a vernacular other than their own, with the view of enabling them to qualify for service over a more extended area of country. The first final examination in this subject under the new rule has been held this year with the result that S. Krishnaji Rao wins the prize easily distancing all other competitors.

14. The second class of the second department contains 26 students, who have recently undergone a satisfactory examination, all being promoted to the first class.

Private W. H. Goddard stands easily first with 1,359 marks out of 1,750. To him is awarded the first prize for general proficiency.

C. A. Hicken takes the second place with 1,238 marks. Having been longer at the college than his fellow-students, he is ineligible for any of the regular scholarships and prizes. A special prize is, however, presented him as a mark of appreciation of the energy and diligence which have enabled him to overcome exceptionally severe difficulties.

Private J. Ruck stands third and gains the second prize for general proficiency.

The next six students in order of merit are—

P. Ananda Rao,	Gunner T. Murphy,
A. Vedanta Chari,	V. S. Sundaram Aiyar,
H. F. Scott,	K. V. Kuryan,

and to the civilians among these are awarded five civil sholarships, each of Rs. 15 *per mensem*.

The next nine students on the list have done well, and the rest of the class fairly so.

15. *Drawing Class* —The first division of nine students has undergone examination for certificates as draftsman and estimator, all being successful. T. Cundaswami Pillai, L. Narasimulu Nayudu and M. A. Muthu Pillai secure second-class certificates, and the rest third class. The Drawing prize is awarded to L. Narasimulu Nayudu. These results are satisfactory; but the first three students on the list would have gained first-class certificates had they done better in estimating.

The second division contains only four students. Two of these, N. B. Rangaswami Aiyangar and P. M. Parthasarathi Pillai, exhibit good results, and have been awarded scholarships of Rs. 8 per mensem.

Candidates other than college students to the number of fifty have also undergone examination for certificates as draftsman. The majority of these are employed in the Public Works department and appear for the examination with the view of obtaining a higher class of certificate than they already possess.

16. *Survey Class.*—The first division of the Survey class consists of four students, who have all been successful in obtaining certificates of qualification as surveyor. A. Periaswami Pillai gains a second-class certificate, and the prize for surveying. The rest secure third-class certificates. Six independent candidates have also undergone examination, but the results are not yet known.

The second division contains eight students. To three of these, viz., G. R. Clarkson, F. Burr and W. Jackson, scholarships of Rs. 8 per mensem have been awarded.

17. *Admission to Junior Departments.*—On 21st April, 72 candidates presented themselves for the entrance examination. Of these, six qualified for the second, and 43 for the special department. In addition, one undergraduate and 67 matriculates (who are eligible for admission without examination) applied for the second department. The accommodation and teaching capacity of the college permitted of 28 of these being accepted. The remainder have been offered admission to the special department; and a few have already signified their acceptance of the offer. The numbers referred to above are far in excess of those which have lately obtained. They point to the advancing popularity of the college, and to the recognition of the fact that sources of employment for men possessing an engineering training are largely on the increase.

18. *Military Students.*—Two men are now passing out of the college, four are in the present second class, five are at Bangalore prepared to join the college after passing an examination in vernacular language, and five have passed the entrance examination and will proceed to the vernacular class early in June.

19. *Photographic Class.*—This class consists of twelve selected students from the second and special departments. Good progress has been made with dry plates; and some of the students' work is exhibited on the tables.

20. *Employment—First Department.*—All the students who obtained college certificates as assistant engineer in 1883, or the degree in civil engineering in 1884, have been afforded temporary employment in the Public Works department, with the view of enabling them to obtain practical qualification for superior appointments. The Government guarantee of one appointment to the Engineer establishment of the Public Works department first takes effect in 1885. If this guarantee is to be given annually in the future, the present large number of applicants for the first department will be further increased; and it will be necessary to consider whether the standard of admission might not advantageously be raised to that indicated by the possession of the University degree of Bachelor of Arts.

21. *Junior Departments.*—Of the overseers who passed out in 1883, all are employed, viz., seven by the Public Works department in various capacities, two by Local Fund boards, and one by the Mysore Government. Recommendations have been made during the year of nine overseers, four surveyors, and ten draftsmen at the request of officers requiring their services, and, in addition, several appointments of draftsmen and surveyors, of which intelligence has not reached me, have doubtless been conferred. The vacancies for engineering subordinates, which are from time to time advertised in the Government Gazette and in the local press, are posted on the college notice board; and their number shows that the supply of trained men is at present smaller than the demand. The classes now passing out have therefore excellent prospect of early employment.

22. *Library.*—During the year, the catalogue, which had become obsolete, and almost useless, was revised by Sub-Conductor Cames, and reprinted, a new and improved classification being adopted. The total number of volumes is now 1,989, the number having been under-estimated in recent annual reports. During the year under review, 78 volumes have been added to the library, and 1,181 books have been issued to masters and students as against 931 in the previous year.

23. The conduct of the students has been, with two or three exceptions, very good. The staff have labored with their usual energy and perseverance; and they will doubtless enjoy the well-earned vacation which commences to-morrow.

Changes in Establishment.—A sixth assistant master was appointed and took charge of the Surveying class on the 30th July 1883, from which date the staff remained at its full strength.

2. On the 30th May last the numbers on the rolls were—

First department	21
Second do.	46
Special do.	25
Total	92

The strength on the same date in 1883 was 70 and in 1882 it was 51, and, arranged according to classes of the community, there were—

	1882-83.	1883-84.
Europeans and Eurasians	11	20
Brahmans	33	41
Hindus (not Brahmans)	15	19
Native Christians	7	9
Muhammadans	1	1
Others	3	2
Total	70	92

3. The preponderance of Brahmans is striking, the number being considerably more than double that of 1881-82. The proportionate increase is greater under Europeans. The almost total absence of Muhammadans is much regretted.

4. *First Department—Engineer Classes.*—The results of the final examination were very satisfactory. Out of eight students, seven appeared and six obtained certificates as assistant engineers, while one obtained a certificate as overseer. The eighth student was unable to attend. The department is again under obligation to the gentlemen who set papers for the examination. The results of the B.C.E. degree examination, for which all the eight students went up, were also very satisfactory, five having been successful and one gaining a place in the first class—a distinction reached only once previously. The Director notes that the students in the first and second classes of the B.C.E. examination are the same as those who stood first and took honors at the

final examination. It is also remarked that the student who could not attend the final examination succeeded in obtaining a degree.

5. The present senior division consists of ten students and the junior of eleven, and at a sessional examination the students are said to have shown satisfactory progress.

6. The Director is glad to hear that the popularity of the first department has increased in a very marked manner, upwards of 30 applications for admission having been received at the commencement of the session. The Principal, however, observes that, with reference to accommodation and teaching capacity as well as the prospects of employment, it is undesirable to admit more than 10 or 12 candidates per annum.

The two first may be valid reasons, but, in the opinion of the Director, it is not for this department to take into consideration the prospects of employment. This is a matter which concerns the student and his friends. The college should afford education to as many students as possible, and thus add, as rapidly as practicable, to the qualified engineering agency of the country. Moreover, the greater the number of paying students the less the cost of the institution to Government. The Principal is further requested to explain the allegation that the accommodation and staff are only sufficient for two small divisions of ten or twelve in this department. It must not be forgotten that the monthly fee in this department is Rs. 15, or Rs. 180 annually.

7. *Second Department—Subordinate Classes.*—The first class consisted of 20 students, and one being ill, 19 underwent examination for certificates of qualification as supervisor and overseer. It is gratifying to note that the whole succeeded, eight qualifying as supervisors and the remainder as overseers.

8. The thanks of the Director are given to the gentlemen who were so good as to serve as examiners. The remarks made by them on the results in the various subjects are almost uniformly favorable; and it is to be noted that, compared with the average of the last five years, these results show a considerable rise. The Principal, however, admits that the average of the five years was somewhat low, owing to the inclusion of a season of depression in the Public Works department which rendered competition for the college less active. Accepting this as qualifying the rise to a certain extent, the gratifying fact has to be recorded that such improvement as has taken place is due to a class of young men of better general attainments having come forward as candidates for the institution. A marked rise in the average under Drawing is said, however, to be in great measure due to the special pains taken by Messrs. Hyde and Hamilton. The Vernacular prize was won by a native student, natives under a new rule having been allowed to compete in a language other than their own vernacular. The Principal is requested to report under what sanction this new rule has been adopted.

9. The second class of the second department, consisting of 26 students, underwent a satisfactory examination, and all were promoted to the first class.

10. *Drawing Class.*—The first division of nine students all passed and secured certificates as draftsmen and estimators. The certificates, however, were only of the second and third class. The second division consisted of only four students. Two produced good results and were awarded scholarships.

11. Fifty candidates, not college students, the majority being *employés* in the Public Works department, underwent examination for certificates as draftsmen. The object, a creditable one, of those already in employment, was to obtain a higher class of certificates than those possessed by them.

12. *Survey Class.*—The first division consisted of four students who have all succeeded in obtaining certificates. Six independent candidates also underwent examination, but the results were not known. The second division consisted of eight students, of whom three scholarships were awarded.

13. *Admission to the Junior Department.*—In April, 72 candidates presented themselves for examination. Of these, six qualified for the second, and 43 for the special department. In addition, one undergraduate and 67 matriculates, all eligible without examination, applied for admission to the second department. The accommodation and teaching capacity of the college permitted of only 28 being accepted. The remainder were offered admission to the special department and a few signified their willingness to join. The above figures testify to the increasing demand for men possessing engineering training. The Principal is requested to explain his reasons for rejecting so many candidates for the second department. The Director is not aware of any order of Government vesting this power in the Principal, and the course adopted appears opposed to the general policy adopted by Government in regard to admission to institutions supported by the State. No application appears to have been made for additional teachers. It is further observed that, in paragraph 21, the Principal remarks that the supply of trained men of this class is apparently less than the demand.

14. *Military Students.*—Two were about to pass out, four were in the second class, five were at Bangalore prepared to join after passing in a vernacular language and five had passed the entrance examination and were to enter the vernacular class.

15. *Photographic Class.*—The class consisted of 12 selected students from the second and special departments: good progress had been made.

16. *Employment—First Department.*—All the students who had obtained college certificates as assistant engineers in 1883 or the degree of B.C.E. in 1884, it is gratifying to record, had obtained temporary employment in the Public Works department with the view of enabling them to obtain practical qualification for superior appointments. If the Government guarantee of one appointment to the Engineer establishment, which is to take effect in 1885, is given annually, it appears to the Principal that the present large number of applicants for the first department will further increase, and the time may come to consider whether the standard of admission should not be raised to the B.A. degree. The effect, however, of this measure would probably be to limit admission to the first department of the institution almost wholly to Hindus, to the exclusion of Europeans and Eurasians. But for this objection, the proposal might probably soon be adopted with advantage.

17. *Junior Departments.*—All the overseers who passed in 1883 have obtained employment in a professional capacity, and numerous recommendations on requisitions were made. Of several appointments of draftsmen and surveyors, the Principal necessarily had not heard. As already noted, the Principal considers that the supply of trained engineering subordinates is at present smaller than the demand, and that there are therefore excellent prospects before the men passing out.

18. *Library.*—The catalogue was revised and improved by Conductor Cames and reprinted, and the library, which had been added to, had been made good use of.

19. The conduct of the students was generally very good, and the staff had worked satisfactorily.

20. Altogether the Director considers that the institution did excellent work during the year, and trusts that it will be practicable in future to admit a far larger number of young men to take advantage of it. No limit is placed on the number of young men entering the Medical College to qualify in medicine, and so also no limit should be placed on the number of young men entering this college to qualify for a profession so necessary to the welfare and progress of the country as engineering. In view of the large demand for admission in both the first and second departments, it becomes a question how far it is necessary for the State to continue to incur considerable expenditure on scholarships. On this point the Principal is requested to report.

21. There were 20 paying pupils on an average in the first department and 13 stipendiary and 57 paying students in the second and special departments, and the fee and sundry revenue amounted to Rs. 6,088 in 1883-84 against Rs. 3,299 in 1882-83, the fees alone having risen from Rs. 3,195 to Rs. 5,618, or by 76 per cent., which is very satisfactory.

(A true Copy and Extract.)

(Signed) H. B. GRIGG,
Director of Public Instruction.

To the Principal, Civil Engineering College.

Copy to the Principal of Government First-grade Colleges.
" " Principal, Government Normal School, Madras.

ORDER—dated 19th August 1884, No. 489, Educational.

Ordered that the report be forwarded to the India office.

(True Extract.)

Chief Secretary.

To the Director of Public Instruction.
" Public Works department.

Exd. J. Wright.

Govt. of {1884} Madras.

EDUCATIONAL.

Issued

Recd. 1/9/84 Encl.

G.O., 19th August 1884, No. 489.

AUGUST.

Civil Engineering College.

Directing transmission to the India office report on the working of the — for the year 1883-84.

4TH DECEMBER 1884, No. 761, EDUCATIONAL.

GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

READ—the following paper:—

Despatch from the Right Honorable the EARL OF KIMBERLEY, Her Majesty's Secretary of State for India, to His Excellency the Right Honorable the Governor in Council, Fort St. George, dated India office, London, 30th October 1884, No. 17 (Public Works).

The annual report of the Civil Engineering College forwarded with your Secretary's letter in the Educational department, No. 490 of 19th August last, affords satisfactory proof of the growing popularity of this institution, as shown in the increased number both of the students actually attending the college and of the candidates seeking admission.

2. It is, however, disappointing to find, in the face of the increasing demand for the benefits of the education offered at the college, that "with reference to accommodation and the teaching capacity of the college as well as the prospects of employment," it was considered undesirable to admit more than ten or twelve candidates per annum. Whilst we should be cautious that an institution supported by the State does not create an artificial supply of Engineers beyond any probable demand, a course which would probably cause only discontent in the end, we should in such an institution give facilities to any number within the limits so indicated, and if the demand for instruction continues as lively as the report shows, the suggestion of the Director of Public Instruction in regard to the maintenance of scholarships is well worthy of attention.

3. I have noticed with satisfaction that temporary employment in the Public Works department was obtained for all the students who gained college certificates as Assistant Engineers in 1883 or the degree of B.C.E. in 1884.

ORDER—dated 4th December 1884, No. 761, Educational.

Communicated to the Director of Public Instruction.

2. Mr. Grigg will submit his views with reference to the remarks contained in paragraph 2 of the despatch.

(True Extract.)

Chief Secretary.

To the Director of Public Instruction.
„ Public Works department.

Exd. J. Wright.

Govt. of {1884} Madras.

EDUCATIONAL.

Issued

Recd. 9/12/84 Encl.

G.O., 4th December 1884, No. 761.

DECEMBER.

Civil Engineering College.

Communicating to the Director of Public Instruction despatch from the Secretary of State reviewing the annual report of the —, and requesting him to submit his views with reference to the remarks contained therein as regards the admission of a larger number of students into the college and the maintenance of scholarships.

GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

READ—the following paper :—

From D. DUNCAN, Esq., M.A., D.SC., Acting Director of Public Instruction, to the Chief Secretary to Government, dated 27th July 1885, No. 5070.

I have the honor to submit three copies of the report on the working of the Civil Engineering College, Madras, for 1884-85, with my review thereon.

ENCLOSURES.

No. 4932.

Proceedings of the Director of Public Instruction, dated 18th July 1885,

Read the following letter from the Principal, Civil Engineering College, Madras, to the Director of Public Instruction, dated 1st June 1885, No. 301-C.

I have the honor to submit the following report on the working of the Civil Engineering College during the past year, and on the results of examinations for certificates which have been held during that period.

2. *Numbers.*—The average numbers on the rolls have been—

First department	19
Second do.	51
Special do.	55
Total ...	125

The numbers arranged by classes of the community are—

Europeans and Eurasians	29
Brahmans	49
Hindus other than Brahmans	33
Native Christians	11
Muhammadans	1
Others	2
Total ...	125

3. *First Department—Engineer Classes.*—In December 1884 the senior division contained ten students, all of whom were successful in gaining diplomas as assistant engineers.

S. A. Subrahmanya Aiyar, B.A., took the first place with honors, gaining the unprecedented proportion of 85·4 per cent. of the total marks.

The next four students—

K. R. Rangaswami Aiyangar,
S. A. Swaminatha Aiyar, B.A.,
V. R. Rangaswami Aiyar,
T. S. Sesha Aiyangar,

pass with credit with percentages ranging from 71·5 to 66·1.

The remaining members of the class—

J. E. A. D'Cruz,
A. C. C. McLeish,
M. Ramakrishna Aiyar,
P. V. Raghavachari,
P. G. Venkatasubba Aiyar,

passed with percentages ranging from 65·3 to 56·1.

One independent candidate, S. G. Krishnaswami Aiyar, who was formerly a student of the College, also appeared for the examination and was successful in obtaining a diploma.

4. I take this opportunity of acknowledging the kindness of the following gentlemen who were so good as to serve as examiners :—

Mathematics.

Arithmetic	Major Sidney Smith, R.E.
Algebra	Captain H. S. Andrews Speed, R.E.
Euclid	B. Hanumantha Rau, Esq., B.A.
Mensuration	Colonel H. L. Prendergast, R.E.
Trigonometry	S. Rangayya Chettiyar, Esq., B.A.
Statics and Dynamics	P. Ranganatha Mudaliyar, Esq., M.A.
Hydrostatics and Pneumatics	Major W. H. Coaker, R.E.

Engineering.

Building Materials and Construction ...	J. A. Jones, Esq., M. Inst. C.E.
Earthwork and Roads	Major C. Bowen, R.E.
Bridges and Irrigation Works	The late Captain R.E. Hamilton, R.E.
Hydraulics	Lieutenant-Colonel J. Pennycuick, R.E.
Practical Mechanics	Captain W. L. C. Baddeley, R.E.
Applied do.	F. B. Hanna, Esq., M.A., M.E., M. Inst. C.E.

Surveying.

Chain, Compass and Sextant Surveying.	A. S. Russell, Esq.
Theodolite Surveying and Traversing ...	Lieutenant-Colonel A. F. Hamilton, R.E.
Levelling	H. J. Thompson, Esq.

Drawing.

Drawing from Specification	Lieutenant-Colonel J. L. L. Morant, R.E.
Estimating	Major A. C. Smith, R.E.

5. In January 1885, the ten members of the class appeared for the B. C. E. Degree examination of the University. The seven following were successful :—

S. A. Subrahmanya Aiyar, B.A.,	*First class.*
S. A. Swaminatha Aiyar, B.A.,	*Second class.*
K. R. Rangaswami Aiyangar,	*Third class.*
V. R. Rangaswami Aiyar,	
T. S. Sesha Aiyangar,	
J. E. A. D'Cruz,	
M. Ramakrishna Aiyar,	

This is the largest number of candidates that has ever secured the engineering degree in any one year; and it is the third occasion in the history of the College in which the degree has been taken in the first class, the previous occasions having been in 1876 and 1884, respectively.

6. The present senior division consists of eight students, and the junior of ten. They have just undergone a sessional examination at which satisfactory progress has been indicated. In the first division, R. A. Srinivasa Aiyangar stands first in all the four main subject heads, and carries off all the prizes, viz. :—

For Mathematics—an aneroid barometer.
For Engineering—a planimeter.
For Surveying and Drawing—an ellipsograph.

In the second division, R. Gopala Aiyar, B.A., stands first and obtains the prize for general proficiency, an Abney's level.

7. *Second Department—Subordinate Classes.*—The senior division of this department contains twenty-six students, all of whom have just undergone examination for certificates of qualification as supervisor and overseer.

8. I take this opportunity of expressing my acknowledgments to the following gentlemen, who kindly set papers for the examination :—

Mathematics.

Arithmetic	L. Garthwaite, Esq., B.A.
Algebra	S. Rangayya Chettiyar, Esq., B.A.
Euclid	P. Ranganatha Mudaliyar, Esq., M.A.
Mensuration	S. A. Subrahmanya Aiyar, Esq., B.A., B.C.E.
Trigonometry and Statistics	B. Hanumantha Rau, Esq., B.A.

Engineering.

Building Materials and Construction ...	J. A. Jones, Esq., M. Inst. C.E.
Earthwork and Roads	Lieutenant-Colonel H. M. Vibart, R.E.
Hydraulics	Lieutenant-Colonel J. Pennycuick, R.E.
Bridges and Irrigation Works	Major C. Bowen, R.E.
Strength of Materials	F. B. Hanna, Esq., M.A., M.E., M. Inst. C.E.

Surveying.

Chain Compass and Sextant Surveying ...	Major Sidney Smith, R.E.
Levelling	W. B. DeWinton, Esq.
Traversing with Theodolite	K. Krishnan Nayar, Esq., B.A., B.C.E.

Drawing.

Drawing from Specification	Lieutenant-Colonel J. L. L. Morant, R.E.
Estimating	Major A. C. Smith, R.E.

Language.

Tamil and Telugu	V. Krishnamachariar, Esq.

9. The following are extracts from the reports of examiners :—

Arithmetic.—Mr. Grathwaite remarks :—"On the whole the answering is good, and reflects credit on teachers and taught."

Algebra.—Mr. Rangayya Chettiyar writes :—"The average is very good, being 62·5. The class, large as it is, has given me immense satisfaction."

Euclid.—Mr. Ranganatha Mudaliyar reports :—"My general impression regarding the results is favorable. No student has particularly distinguished himself, but the average of 52 per cent. is very satisfactory."

Mensuration.—Mr. Subrahmanya Aiyar states that "the results are very satisfactory." Private Goddard and T. Abboye Aiyah submitted excellent papers.

Trigonometry and Statics.—Mr. Hanumantha Rau reports that Private Goddard sent in good, and six other candidates fair, papers; but that the other results were indifferent.

Building Materials and Construction.—Mr. Jones considers that "the general results are satisfactory, the largest percentage being 88 and the lowest 31."

Earthwork and Roads.—Colonel Vibart writes :—"The papers, as a whole, can hardly be considered satisfactory."

Hydraulics —Colonel Pennycuick observes :—"The answers on the whole are good, and rather above the average. Private Goddard has obtained full marks, and two others, Gunner Murphy and P. Ananda Rau, would have done so but for very trifling errors."

Bridges and Irrigation Works.—Major Bowen writes :—"The answering of the first three men, Gunner Murphy, C. A. Hicken and Private Goddard, I consider very good, and that of the eight following very fair, the nature of the paper considered. The others were not up to the mark, but the questions were somewhat difficult for the class, and required care and thought in answering."

Strength of Materials.—Mr. Hanna reports :—"The answering was above the average, as nine candidates gained from 60 to 85 per cent., and eleven others from 30 to 60 per cent. The answering of Private W. H. Goddard, who heads the list, shows a much clearer knowledge of this subject than is usually met with."

Chain, Compass and Sextant Surveying.—Major Sidney Smith states that "the paper was only indifferently answered, three candidates obtaining over 75 per cent., and eight others 50 per cent. and over." Private Ruck, K. V. Kuryan and Private Goddard are, however, commended for their answering.

Levelling.—Mr. DeWinton observes :—"The answers show generally a sufficient knowledge of the subject, an average of 70 per cent. being obtained, and some are very creditable." C. A. Hicken, Gunner Murphy and A. B. Power stand highest in this subject.

Traversing with Theodolite.—Mr. Krishnan Nayar reports :—"The answers given by the first seven on the list were very satisfactory, those by Private W. H. Goddard being in every respect the best. The average percentage for the class is 56."

Drawing from Specification.—Colonel Morant observes :—"The greater part of the drawings were very neatly done, and accurately drawn. Pains have evidently been taken in teaching the students."

Estimating.—Major A. C. Smith writes :—"The results on the whole are satisfactory ; those of the first fourteen highly so, while those of the next seven are fairly good." K. V. Kuryan, Private Goddard, C. Ramaswami Aiyar and Private Ruck occupy the highest places on the list.

Language.—Mr. Krishnamachariar considers that "the results are on the whole fair, but there has evidently been want of practice in writing from dictation."

10. On comparing the results of the examination with the average of the last five years, it will be found that there has been—

A fall of 2 per cent. in Mathematics.
A rise of 1 „ „ „ Engineering.
„ „ 2 „ „ „ Surveying.
„ „ 4 „ „ „ Drawing.
„ „ 5 „ „ „ Language.
„ „ 1 „ „ on the total.

11. All the twenty-six candidates have passed. Seven obtain certificates as supervisor, Public Works department, having gained not less than 35 per cent. of marks in each subject, and 60 per cent. of the total, and the remainder secure certificates as overseer, the qualification for which is 25 per cent. in each subject and 40 per cent. of the total.

Private W. H. Goddard, Somersetshire Light Infantry, is *facile princeps*, with 2,049 marks out of a possible 2,600. He obtains a certificate as supervisor, and gains all but one of the prizes offered for competition by the class—

For distinguished proficiency—the Royal Engineer Officer's prize.
For Mathematics—case of drawing instruments.
For Engineering—a lever watch.
For Surveying—a case of spring bows.
For Drawing—a parallel rule.

Private J. Ruck, South Wales Borderers, and Gunner T. Murphy, Royal Artillery, occupy the second and third places with 1,792 and 1,777 marks, respectively. A Vedantachari and P. Ananda Rau are equal with 1,717 marks. All these men, together with V. Sundara Aiyar and K. Kuryan, obtain certificates as supervisor.

The remaining nineteen students secure certificates as overseer, one of them, W. Yethirajulu Mudaliyar, who occupies the thirteenth place on the list, gaining the prize for vernacular language, a box of colors. One student, J. E. Vas, who joined in January last after a year's study in the first department, is not classed with the remaining candidates owing to his not being required to qualify in language.

12. The junior division of the upper subordinate class contains twenty-four students who have just undergone a satisfactory sessional examination, all of them being promoted to the first class. Sergeant W. L. Emery, Royal Scots Fusiliers, stands easily first with 1,367 marks out of 1,650. To him is awarded the prize for general proficiency consisting of a pedometer.

Lance Corporal Reynolds, 12th Lancers, occupies the second place with 1,169 marks.

The next seven students in order of merit are—

A. Krishna Menon,
M. V. Krishnaswami Aiyar,
Lance Corporal J. W. Jones, Hampshire Regiment,
M. C. M. Mascarenhas,
Lance Corporal P. King, Hampshire Regiment,
M. Gnanapragasam Pillai,
F. S. Piedade Lobo,

and to the civilians among these are awarded civil scholarships each of Rs. 15 per mensem tenable during the ensuing year.

The next eight students on the list have done well, and the rest of the class fairly so.

13. *Draftsman's Class.*—The senior division of nine students has undergone examination for certificates as draftsman and estimator, all being successful. A. Periyaswami Pillai secures a second-class certificate and the rest third class. The prize for drawing, consisting of a case of proportional compasses, is awarded to A. Appana Aiyangar. Several of these men are excellent draftsmen, and would have obtained first-class certificates had more attention been paid to estimating for bridges and irrigation works as compared with estimating for buildings.

The junior division contains twenty-one students whose examination shows fair results Scholarships of Rs. 8 per mensem are awarded to the following students :—

M. Angamuthu Mudaliyar.
E. A. Sivakrishnaswami Aiyar.
S. W. Damodara Pillai.
A. Thumbu Chetti.
A. S. David.

The last mentioned must, however, relinquish his scholarship if he avails himself of permission which has been given him to join the second department next year.

14. *Surveyor's Class.*—The senior division consists of seven students who have all been successful in obtaining certificates of qualification as surveyor. Two, G. R Clarkson and T. A. Gnanaprakasa Pillai, secure second-class certificates, and the rest third class. The prize for surveying, consisting of a set of Marquois scales and a letter weighing instrument, is awarded to G. R. Clarkson.

The junior division contains fifteen students who have passed a very fair sessional examination. Scholarships of Rs. 8 per mensem are awarded to the five following :—

M. T. Ramanujayya.
J. M. Berlie.
Saiyid Roza Husain.
J. A. Bowie.
H. Lawrence.

15. *Independent Candidates.*—Candidates other than College students to the number of eighty-seven have also undergone examination for certificates, viz., sixty-nine as draftsman, and eighteen as surveyor. The majority of these are employed in the Public Works department and Local Fund Boards, and appear for the examination with the view of obtaining a higher class of certificate than they already possess.

16. *Admission to the Junior Depatments.*—The number of registered applications for admission this year was 120 from matriculates and 102 from candidates for entrance examination. Of the latter, twenty-nine qualified for the second department and fifty-one for the special department. Owing to insufficient accommodation and teaching capacity, a comparatively small proportion of the candidates can be admitted. The vacancies in the second department have been filled by twenty-three matriculates and thirteen entrance examinees. These, with two military students from the vernacular class, make up a total of thirty-eight. Of the twenty-three matriculates, three have passed the first examination in arts, and eight are matriculates of the first class, so that good results may be anticipated from the entering batch. The vacancies in the surveyor's and draftsman's classes have been filled by eighteen matriculates and forty-eight entrance examinees. Several other matriculates submitted applications for the special department too late for compliance.

The numbers above referred to are far in excess of those usually prevailing ; and they indicate a rapidly increasing appreciation of the advantages to be derived from a technical training such as that given at this College. It is unfortunate that the College is unable to respond to the claims made on it to their full extent ; but with the present accommodation it is impossible to give efficient instruction to greater numbers than will be on the rolls in August next. The present mode of entrance to the second department, partly by selection and partly by examination, is unsatisfactory ; and admission will be regulated in future by an examination for which matriculates only will appear.

17. *Walker Scholarship* —This scholarship, which falls vacant in August, was competed for by eleven natives of West Coast districts by examinations held at Calicut and Mangalore. My thanks are due to Colonel Ross Thompson, R.E., at the former station, and to Mr. Marjoribanks and the Rev. Mr. Hoch at the latter, for arranging for the vernacular tests in Malayalam and Canarese, respectively. The successful candidate, T. Jacob, will join the second department in August.

18. *Military Students.*—Four men are now passing out of the College, five are in the present second class, two are at Bangalore prepared to join the College after passing an examination in vernacular language, and one has passed the entrance examination and will proceed to the vernacular class early in June. The smallness of the last two figures is understood to be due to actual and possible departures for field service.

19. *Photographic Class.*—This class consists of twelve selected students from the second and special departments. Good progress has been made under Mr. Hyde's careful instruction, and some of the students' work is exhibited on the tables.

20. *Examining Agency.*—All sessional examinations as well as examinations for certificates as surveyor and as draftsman are conducted by the College staff ; but the Government has always considered it desirable that the majority of the tests for the more important diplomas qualifying for employment in the engineer and upper subordinate establishments of the Public Works department should be applied by examiners independent of the institution. To conduct these

examinations, officers of the corps of Royal Engineers, officers of the Public Works department and of the railways, as well as many native gentlemen, have generously responded to the Principal's invitation by coming forward and devoting their time and labor, unremunerated, to the laborious work of examining. I owe a debt of gratitude to those gentlemen which I cannot adequately express. There have of late been some signs of impatience at the frequent recurrence of examinations, and the Principal has found it necessary to implore rather than invite co-operation. Now that examination subjects have multiplied, and that College diplomas have a higher value than they ever before possessed, it does not seem right that the arrangements for final examinations should continue to depend on the feelings of personal friendship for the Principal which examiners are so good as to entertain, and I trust that the Government will be able to provide definitely in future for the conduct of these tests.

21. *Employment—First Department.*—The current year marks the commencement of an important era—an era in which the higher ranks of the Public Works department are for the first time systematically opened up to the local Engineering College. For many years Rurki has regularly provided the Imperial Government with a portion of the recruits annually required for the engineer establishment, and in Madras there have been five instances during the last twenty years in which appointments as assistant engineer have been conferred on passed men of the College first department. Now, however, a fixed allotment of appointments is made by Government to the different Indian Engineering Colleges, the proportion falling to Madras being at present one per annum. The first student to profit by this enlightened policy is Mr. S. A. Subrahmanya Aiyar, B.A., B.C.E., whose distinguished attainments were referred to in the early portion of this report. He was appointed assistant engineer, third grade, on 1st April last and posted to the Sangam Project division to acquire that practical experience without which no person, however fine a theorist, can become a useful engineer. I entertain no doubt that Mr. Subrahmanya Aiyar's excellent abilities, coupled as they are in his case with practical sense, will enable him to do credit to the position which devolves on him.

Of the remaining students who passed out in December, one has been appointed to the Revenue Survey, one to State Railway surveys, three to the upper subordinate establishment, Public Works department, and four to surveys in connection with relief works. Several of these may expect higher appointments than they at present hold, but they have, in my opinion, done wisely in seizing the first opportunities which presented themselves for the acquirement of knowledge of the practical details of work.

I have also to report with pleasure that during the year under review Mr. K Krishnan Nayar, B.A., B.C.E., whose distinguished College achievements will be found recorded in my last annual report, was appointed an assistant engineer on the South Indian Railway on a very substantial salary. This appointment is exceptionally important, as the engineer establishments of the Guaranteed Railways in this presidency have hitherto been regarded as a closer preserve for Europeans than even the Public Works department. I feel sure that the work executed by Mr. Krishnan Nayar will never cause Mr. Logan to regret the appointment which he was instrumental in procuring.

Another passed student of the same batch, Mr. Anantha Raman Natesan, has, it is understood, been appointed an assistant engineer under the Government of Maisúr.

22. *Junior Departments.*—Of the nineteen students who passed out last year, four are known to be employed as overseers, four as delta or channel superintendents, and three as surveyors, while one has joined the Salt department. As the College continues to lend active aid to passed students in obtaining employment, it may safely be concluded that the remaining members of the class, regarding whom no information has been received, are provided for. Similar remarks apply to the draftsmen and surveyors of 1884.

As regards the prospects of the students now passing out, I surmise that the restrictions of civil expenditure due to military preparations will not permit of many appointments being made just at present to the upper subordinate branch of the Public Works department. The case is different with draftsmen for whom there is an urgent demand both in the Public Works department and elsewhere. The Public Works department is, however, by no means the only source of employment; and a reference to the Government Gazettes and to the columns of the daily press will show that there is a wide demand for engineers and upper subordinates as well as for surveyors and draftsmen. These notifications are posted in the College as they appear, and from them passed students are able to form a very fair idea of the demand which exists for their services. During the year recommendations have been made of two engineers, twelve surveyors and three draftsmen at the request of officers requiring their services. Many more draftsmen would have been recommended had they been available.

23. *Apparatus.*—Several good models have been added to the collection, some of which were ordered from England, while others were planned in the College and executed by native carpenters in Madras. One excellent model of the Nellore tank escape was constructed at the Madras Railway Terminal Workshops, and I take this opportunity of expressing my thanks to Mr. Robinson and Mr. Carter for very kindly undertaking and carrying out the work. Among

the new models, which are freely used for instructional purposes, may be mentioned—

A six-inch trussed partition.
Trussed beam for a traveller.
Fifty timber joints in hard wood.
Two sets iron roof connections.
Small tank escape.
Shell lime-kiln.
Water wheels, overshot and undershot.

Among the instruments received during the year, a transit theodolite, an integrator and a double Attwood's machine deserve mention.

24. *Library.*—During the year, 163 volumes have been added to the collection, which now consists of 2,086 volumes. The issues of books to masters and students were 2,085, equivalent to the total number in the library, the corresponding number last year having been 1,181.

25. *General.*—The conduct of the students, military and civil, has been very good and the attendance regular, the average present daily being 92·5 per cent. of the total numbers on the rolls.

The generally satisfactory results of the year's working have been due, not only to diligence on the part of the students, but to the care and patience devoted to their training by the different members of the instructional staff, whom I now thank for their assistance and co-operation. The year saw no changes in the staff until to-day when closes the official career of the Telugu Munshi, Mr. Lakshminarasayya Pantulu. Entering the service in 1851 and the College in 1859, Lakshminarasayya Pantulu attained the age of 55 in 1879. Extensions of service have, however, been from time to time sanctioned, which have enabled him to remain at his post until the end of the present session. I cannot permit him to leave without expressing appreciation of the valuable work which he has throughout a long series of years done at this College.

26. The institution closes to-morrow for the recess. I trust that both masters and students will enjoy the rest and leisure which they have well earned and will, with renewed vigour, return to work at the end of the vacation.

THE average numbers on the rolls show a fall of two in the first department, but a rise of five in the second and of thirty in the special department. The figures are—

	1884-85.	1883-84.
First department	19	21
Second do.	51	46
Special do.	55	25
Total ...	125	92

2. The numbers for the same two years, according to the classes of the community, are—

	1884-85.	1883-84.
Europeans and Eurasians	29	20
Brahmans	49	41
Hindus other than Brahmans	33	19
Native Christians	11	9
Muhammadans	1	1
Others	2	2
Total ...	125	92

The increase indicates a satisfactory state of things, but the Muhammadan element seems still to be much in the background.

3. The results of the examination of the senior division of the first department were an improvement even on those of the previous year. There were ten students, and all were successful in gaining diplomas as assistant engineers. S. A. Subrahmanya Aiyar, B.A., took the first place with honors, and four more students passed with credit, while of the remaining number, none obtained less than 56·1 per cent. of marks. An independent candidate, formerly a student of the College, appeared for the examination and obtained a diploma. The same ten students appeared for the B.C.E. examination and seven passed almost, it is satisfactory to note, in the same order as that in which they stood at the engineer examination. That the first department is in a high state of efficiency is manifest from the fact that the B.C.E. degree has been taken by a larger number of students than at any time previous, and from the circumstance that for the third time since the institution of the degree one of them has been placed in the first class.

4. The department is again under obligation to the gentlemen who conducted the College examination.

5. The present senior division consists of eight students and the junior of ten, which shows that the first department has no difficulty in keeping up its numbers. The progress of the students is favorably reported on.

6. The senior division of the second department consisted of twenty-six students, and it is satisfactory to find that all have passed at the examination held in May — seven obtaining certificates as supervisors and the rest as overseers.

7. The department is under obligation to the gentlemen who conducted this examination. The extracts given from their reports are, on the whole, very favorable. With the exception of mathematics, in which there is a fall of 2 per cent., there is a rise in all the other subjects when compared with the average of the last five years, as well as a rise of 1 per cent. on the total.

8. The junior division, consisting of twenty-four students, had just gone through a satisfactory sessional examination and earned promotion.

9. The senior division of the draftsman's class consisted of nine students: one secured a certificate of the second class and the others third-class certificates. It is stated that several of the students are excellent draftsmen, and that they would have obtained first-class certificates had they paid more attention to estimating for bridges and irrigation works, as compared with estimating for buildings.

10. The junior division consisted of twenty-one students, whose examination showed fair results.

11. The senior division of the survey class consisted of seven students, two of whom secured second and the rest third-class certificates.

12. The junior division consisted of fifteen students who had passed a very fair sessional examination.

13. Sixty-nine independent candidates appeared for examination as draftsmen and eighteen as surveyors. The majority were employed in the Public Works department and under Local Fund Boards and desired to obtain a higher class of certificate than that possessed by them.

14. The applications for admission to the junior department have been more numerous than ever and generally they have proceeded from persons who have received a superior education. This is indicative of the growing popularity of the institution and also gives promise of even better results in future. It is matter for regret, therefore, that all the students qualified cannot be admitted. The recruiting of the second department hereafter by examination only, to which no one with lower qualifications than matriculation will be admitted, is approved.

15. The Walker scholarship was competed for by eleven natives of the West Coast districts, and secured by S. Jacob who joins the second department. The examinations were held at Calicut and Mangalore.

16. The smallness of the number (three) of military students who are to enter the institution is attributed to actual and possible departures for field service.

17. The photographic class appears to have made good progress.

18. The arguments for the appointment of a body of examiners for conducting the College examinations are very weighty and will receive attention.

19. The Principal justly observes that the current year marks an important era in the history of the institution, the higher ranks of the Public Works department having been systematically opened for the first time to its students in accordance with the orders of the Supreme Government guaranteeing one such appointment annually to the College. The Acting Director of Public Instruction congratulates Mr. S A. Subrahmanya Aiyar, B.A., B.C.E., on his having won the distinction of entry into the superior service of the department, and trusts that his future career will fully justify the high opinion formed of him by Captain Love.

20. The Acting Director is also glad to note that the remaining students who passed out of the first department have secured fairly remunerative appointments.

21. Mr. Krishnan Nayar, B.A., B.C.E., the most distinguished student of the previous year, the Acting Director is glad to learn, has been appointed an assistant engineer on the South Indian Railway, while another student has been employed by the Government of Maisúr. While the popularity of the College is increasing, it is gratifying to record that students of merit find no difficulty in getting employment, and there is no doubt that the demand will continue to increase.

22 It is satisfactory that, as far as can be traced, the passed students of the other departments have also obtained remunerative employment.

23. The Principal anticipates some difficulty in regard to the employment in the Public Works department of the engineering students now leaving, owing to the restrictive orders with reference to civil expenditure, but he anticipates no such difficulty in regard to draughtsmen for whom there is an urgent demand everywhere.

24. The institution, partly through the kindness of Messrs. Robinson and Carter, had received an accession of good models. It had also received some valuable instruments.

25. The library had received a considerable addition, and the books had been very freely used by masters and students.

26. The conduct of the students, it is satisfactory to note, had been very good. The Principal has placed on record his appreciation of the assistance rendered him by the staff.

27. Altogether the Acting Director has read this record of the year's work with much pleasure.

(A true Copy and Extract.)

(Signed) D. DUNCAN,
Ag. Director of Public Instruction.

ORDER—dated 5th August 1885, No. 485, Educational.

Ordered that the report be forwarded to the India office.

(True Extract.)

Chief Secretary.

To the Director of Public Instruction.
" Public Works department.

Exd. J. Wright.

Govt. of [1885] Madras.

EDUCATIONAL.

Issued

Recd. 20/8/85. *Encl.*

G.O., 5th August 1885, No. 485.

AUGUST.

Civil Engineering College.

Forwarding to the Under Secretary of State for India, Proceedings of Government embodying the report on the working of the — in this presidency for 1884-85.

GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

READ—the following paper:—

From D. DUNCAN, Esq., M.A., D.Sc., Acting Director of Public Instruction, to the Chief Secretary to Government, dated Madras, 30th August 1886, No. 5937.

I have the honor to submit three copies of the report on the working of the College of Engineering, Madras, for 1885-86, with my review thereon.

ENCLOSURE.

PROCEEDINGS OF THE DIRECTOR OF PUBLIC INSTRUCTION, dated 20th August 1886. No. 5779.

Madras College of Engineering.

Read the following letter from the Principal, Civil Engineering College, to the Director of Public Instruction, dated Madras, 31st May 1886, No. 162-C.

I HAVE the honor to submit the following report on the working of the College of Engineering during the past year, and on the results of examinations for certificates which have been held during that period.

2. *Numbers.*—The average numbers on the rolls have been:—

Engineer classes	18
Engineer Subordinates' classes	62
Draftsmen's classes	55
Surveyors' classes	40
Total ...	175

The numbers arranged by classes of the community are:—

Europeans and Eurasians	29
Brahmans	68
Hindus other than Brahmans	60
Native Christians	14
Mussalmans	3
Others	1
Total ...	175

3. *Changes in Establishment.*—Mr. H. Narasinga Rau, B.A., was appointed on 17th August 1885 to fill the vacancy caused by the retirement of the Telugu Munshi, Mr. Lakshminarasayya Pantulu, which was alluded to in last year's report. With this exception, the staff has remained unchanged throughout the session. From the present date, however, Mr. M. Kenny, B.A., First Assistant Master, is transferred to Berhampore College, and Mr. Rajagopala Mudaliyar, the Tamil Munshi, after a period of twenty-seven years' uninterrupted duty, retires from the service. Under Mr. Kenny, who joined the college in August 1880, the senior classes have always made good progress in mathematics. Mr. Rajagopala Mudaliyar entered the college in 1859, and attained the age of 55 in 1877; but extensions of service have

from time to time been sanctioned, which have enabled him to remain at his post until the close of the present session. I cannot permit him to leave without expressing appreciation of the excellent work which, during a long series of years, he has done at this college.

4. *Reorganization of the College.*—The year is memorable as heralding a reorganization of the institution which has been under consideration since 1880. In that year, Colonel Macdonald, the Director of Public Instruction, suggested the desirableness of introducing changes based on the scheme which had then lately been approved by the Honorable the Lieutenant-Governor of Bengal for the establishment of an Engineering College at Calcutta. The Madras Government referred the matter to a committee consisting of Engineers of the Public Works Department, the Railways, and Harbour Works, and of Educational officers, presided over by Colonel Shaw-Stewart, R.E. The committee recognised the principle that the college should train men not for the Public Works Department only, but for the country generally; and they submitted reports in 1881 and 1882, advising an increase in the theoretical courses of instruction to admit of Mechanical as well as Civil Engineering subjects being introduced, and the establishment of practical courses to fit all passed students for immediate employment on works, including those who might not be appointed to the Government service. After considerable discussion and criticism by the heads of the Public Works and Educational Departments, the detailed recommendations of the committee were adopted with slight modifications, and the reorganization scheme as finally approved was sanctioned in July 1885, and ordered to be introduced from 1st January of the current year. The classes to be formed are for—

(1) Civil Engineers.
(2) Mechanical Engineers.
(3) Engineer Subordinates.
(4) Draftsmen.
(5) Surveyors.
(6) Sub-Overseers, Maistries and Artizans.

The designation of the institution has been changed from *Civil Engineering College* to *College of Engineering*, so as to embrace the mechanical branches of the profession. The theoretical courses will extend over three years for Engineers, for two and a half years for Engineer Subordinates, and for two years for Draftsmen and Surveyors; and the times of admission will be so adjusted that the final examinations of all classes will take place simultaneously in December. The practical courses will comprise a period of workshop training and a period on Engineering works in progress, and will be undergone by the Engineer and Engineer Subordinates' classes. The details of the practical courses are, however, not yet settled.

Admission to the Engineer and Engineer Subordinates' classes is regulated by competitive examination, open, under restrictions as to age, health, &c., to persons who have passed the First Arts and Matriculation Examinations respectively of an Indian University; the classes for Draftsmen and Surveyors are open to persons who have passed the Middle School Examination; while that for Sub-Overseers and Maistries is reserved for the sons of artizans and for youths who have had practical training in the building trades. Non-commissioned officers and soldiers of British Regiments are eligible, as heretofore, for admission to the Engineer Subordinates' class, but they will undergo their probationary year of instruction at the college instead of at Bangalore.

The theoretical courses for the different classes will comprise some or all of the following branches:—Mathematics, Physical Science, Civil and Mechanical Engineering, Surveying, Drawing, and Vernacular Language. Examinations of students will take place as a rule annually, and the marks gained will count towards the final total. All the examinations will be conducted by a Board of Examiners appointed by Government. The rates of fee payment for the theoretical courses have been raised; but no fees will be demanded for the practical courses, and, during a portion of the latter, subsistence allowances will be paid to the students. Seven scholarships, ranging from Rs. 30 to Rs. 8 per mensem, are open to students for competition.

One appointment annually as Assistant Engineer in the Public Works Department, as well as a certain number of Supervisorships, will be conferred annually on passed students of the Engineer class. Overseerships in the department are open to those of the Engineer Subordinates' class, appointments as Draftsmen to those of the Draftsmen's class, while passed Surveyors are eligible for the Public Works and Madras Survey Departments.

5. *Requirements.*—From this brief sketch of the new scheme, it will be perceived that a great stride in the progress of the technical education afforded by this institution is about to be made. Additional classes, longer courses, and new subjects cannot, however, be introduced without the provision of a larger staff and more extended accommodation. Suitable lecture-rooms and a laboratory are needed; a museum, a drawing office, and examination hall must be provided; and a reinforcement of the staff is urgently required. Full proposals have been submitted in connexion with these wants, but I am not yet in a position to report on the steps which are to be taken to supply them. In January, classes of (1) Engineers, (2) Draftsmen, and (3) Surveyors were formed under the new rules, and in August a class of Engineer Subordinates will be established. At the present moment, therefore, the old and new courses of study progress side by side, though with unequal steps. Up to the present date it has been found possible to meet most of the earlier needs of the newly formed classes; but I assert in the most positive terms that, without the immediate provision of some additional staff and accommodation, the requirements of the new scheme cannot continue to be carried out.

6. *Examining Agency.*—Before proceeding to report on the work executed by the various classes during the year under review, I have to refer to the remarks made in last year's report on the College Examining Agency. In response to the arguments offered, Government appointed a Board of Examiners to conduct the final examinations of the two senior departments. Their duties commenced in December last with the examination of the Engineer class, and they continued during the current month with that of the Engineer Subordinates' class. The final examinations of the Draftsmen's and Surveyors' classes are still conducted by the College staff, though the new rules contemplate their ultimate transfer to the Board.

7. *Engineer Classes.*—In December 1885, the senior class of eight students was examined by the Board, with the result that all the candidates obtained diplomas as Assistant Engineer. The first man, R. A. Srinivasa Aiyangar, B.A., passed with honors, gaining 84·3 per cent. of the total marks. His position secured for him the guaranteed appointment to the Engineer establishment of the Public Works Department, and he was posted to the Godávari Eastern Division on 1st April last. My knowledge of his character and abilities leads me to expect that he will prove a good servant to the Government.

The next three candidates, V. Aiyaswami Aiyar, B.A., R. V. Subrahmanya Aiyar, and G. V. Subrahmanya Aiyar, passed with credit, with percentages ranging from 71 to 67. The remaining four students, M. A. Ananthalwar, B.A., D. V. Jagannathachari, C. Madhava Rau, and T. Ramaswami Aiyangar, obtained an ordinary pass with percentages ranging from 64 to 51.

One independent candidate, who was formerly a student of the college, also presented himself, but was absent during the greater part of the examination.

In January, the eight students above referred to appeared for the University examination for the degree of Bachelor of Civil Engineering. The following three were successful:—

R. A. Srinivasa Aiyangar, B.A.
V. Aiyaswami Aiyar, B.A.
R. V. Subrahmanya Aiyar.

8. The present senior division consists of ten students and the junior of eight. The latter were admitted by a competitive examination in December last under the new rules, the candidate at the head of the list, R. Srinivasa Aiyangar, B.A., winning the scholarship of Rs. 30 per mensem. This will be re-competed for by

the entered students in December of the current year. Both divisions have just undergone a sessional examination, at which satisfactory progress has been indicated. In the first division, R. Gopala Aiyar, B.A., stands easily first, winning the prizes for Mathematics and Engineering—an aneroid barometer and planimeter respectively. The prize for Drawing and Surveying—an ellipsograph—is secured by A. V. Panchapakesa Aiyar, B.A.

In the second division, R. Srinivasa Aiyangar, B.A., heads the list, and wins the prize for general proficiency, consisting of an Abney's level.

9. *Engineer Subordinates' Class.*—The senior division of this class contains twenty-four students who have just undergone examination at the hands of the Board of Examiners for certificates of qualification as Supervisor and Overseer. The remarks of the Board, which form an appendix to this report, are to the effect that the results are very satisfactory, the average total marks being 60 per cent. of the maximum, and that the five military students who occupy the first, third, fifth, sixth and eighth places on the list have done work which is especially creditable to them. Of the twenty-four students examined, ten obtain certificates as Supervisor, having gained not less than 35 per cent. of the marks in each subject and 60 per cent. of the total; thirteen take certificates as Overseer, the qualification for which is 25 per cent. in each subject and 40 per cent. of the total; and one fails.

10. Corporal W. L. Emery, Royal Scots Fusiliers, stands at the head of the list with 81 per cent. of the total marks. He obtains a Supervisor's certificate and carries off the following prizes :— For distinguished proficiency, the Royal Engineer Officer's prize; for mathematics, a case of drawing instruments; for surveying, a case of spring bows.

The second place is taken by M. V. Krishnaswami Aiyar with 76 per cent. of the total marks. He secures a Supervisor's certificate.

Lance-Corporal B. Reynolds, 12th Royal Lancers, occupies the third place with 75 per cent, taking a Supervisor's certificate and gaining the following prizes :— For Engineering, a lever watch; for drawing, a parallel rule.

The following students also gain certificates as Supervisor :—

A. Krishna Menon.	Gunner J. Knox, Royal Horse Artillery.
Lance-Corporal P. King, Hampshire Regiment.	G. Padmanabha Aiyar.
	A. Narayanaswami Nayudu.
E. C. M. Mascarenhas.	M. Gnanaprakasa Pillai.

Thirteen others obtain certificates as Overseer, one of them, V. Ramakrishnayya, winning the prize for Vernacular Language.

11. On comparing the results of the examination with the average marks of the last five years, it will be found that there has been—

A rise of 3 per cent. in Mathematics.
„ 6 „ „ Engineering.
„ 3 „ „ Surveying.
„ 12 „ „ Drawing.
An unchanged percentage in Language.
A rise of 6 per cent. in the total.

I attribute this decided improvement mainly to the circumstance of having better material to work on; but I consider that the substantial increases under Engineering and Drawing are due also to the conscientious and painstaking manner in which the 2nd, 3rd and 4th Assistant Masters, Sub-Conductor Cames, and Messrs. Hyde and Hamilton have carried out the duties entrusted to them.

12. The junior division of the Engineer Subordinates' class contains thirty-eight students, who have just undergone a satisfactory sessional examination. Mahomed Sikandar occupies the first place with 81 per cent. of the total marks, and gains the prize for general proficiency—a pedometer.

The next four students in order of merit are—

F. A. Pope	A. P. Doll
A. V. Krishnaswami Pillai	W. Clay

and to these are awarded scholarships of Rs. 15 each per mensem tenable during the ensuing year.

13. A new division of this class will be formed in August. The entrance examination was held by the Board of Examiners on 3rd May, when thirty-eight Matriculates presented themselves. The results have not yet been published.

14. *Draftsmen's Class.*—The senior division of nineteen students has just undergone examination for certificates as Draftsman and Estimator. Four secure certificates of the first class, five of the second class, and nine of the third class, while one fails. A. Thambu Chetti stands at the head of the division with 90 per cent. of the total marks, and gains the prize for drawing, a case of proportional compasses. The remaining winners of first-class certificates are—

E. A. Sivakrishnaswami Aiyar.	A. V. Ramachandra Aiyar.
M. Angamuttu Mudaliyar.	

The second division contains twenty-six students, who have undergone a satisfactory sessional examination. Scholarships of Rs. 8 per mensem are awarded to the following students of this division :—

J. C. A. Ellis.	P. Ramaswami Nayaker.
M. Sankaranarayana Pillai.	R. Srinivasa Aiyar.
J. D. Francis.	

The third division formed in January last under the new rules contains twenty students.

I consider that the results of the examinations in the Draftsmen's class are very creditable to the instructor, Mr. Pope.

15. *Surveyors' Class.*—The senior division consists of twelve students, eleven of whom secure certificates as Surveyor, viz., two of the first class, Saiyid Raza Husain and J. M. Berlie, five of the second class and four of the third class. The remaining member of the class, M. T. V. Ramanujayya, one of its best students, appeared as an independent candidate for the Overseer's Certificate examination, and was successful. The prize for surveying is won by Saiyid Raza Husain, who stands first with 85 per cent. of the total marks. The average percentage of marks for this division is 69.

The second division contains twenty-three students, who have undergone a satisfactory sessional examination. Scholarships of Rs. 8 per mensem are awarded to the following students :—

M. S. Swaminatha Aiyar.	E. Stuart.
C. C. Somasundara Mudaliyar.	V. Lakshmana Rau.
A. Pereira.	

The third division, formed in January last under the new rules, contains ten students.

Two of the students of the junior divisions, H. R. White and G. Haller, volunteered for the final examination as independent candidates, and were successful, both gaining second-class certificates.

The results obtained by the Surveyors' class are above the average, and reflect credit on Mr. Campbell's instruction.

16. *Independent Candidates.*—Candidates, not belonging to the senior divisions of the different college classes, presented themselves, to the number of one hundred and twenty-seven, for examination for certificates, viz., two as Overseer, ninety-seven as Draftsmen, and twenty-eight as Surveyor. The majority of these are employed in the Public Works Department and Local Fund Boards, and appear for the examination with the view of obtaining a higher class of certificate than they already possess. The results of the examination are not yet published.

17. *Sub-Overseers' and Maistries' Class.*—This class, for admission to which several applications have been received, should have been formed in January last. It cannot, however, be established until additional staff and accommodation have been provided.

18. *Proposed Survey Probationers' Class.*—The Superintendent, Madras Survey, is desirous that the probationers for the superior establishment of his department should undergo a course of training in mathematics at this college. It is proposed that a special master be entertained, and that all charges connected with the instruction and examination of the class be defrayed by the fees of the candidates. The class is not likely to consist of more than four students, and the course of study will last from six months to a year.

19. *Military Students.*—Five men are now passing out of the college, three are in the present junior division of the Engineer Subordinates' class, one is at Bangalore prepared to join the college after passing an examination in vernacular language, and four candidates will present themselves for the entrance examination in July.

20. *Photographic Class.*—This class consists of twelve students selected from the Engineer and Engineer Subordinates' classes. Good progress has been made under Mr. Hyde's instruction, and some of the students' work is exhibited on the tables to-day.

21. *Library.*—During the year 216 volumes have been added to the library, which now contains 2,302 volumes. The issues of books to masters and students were 2,603, having increased just ninefold during the last six years.

22. *Apparatus, &c.*—A fresh supply of surveying instruments has been received from England, and a model of a Stoney's sifter has been made locally. I take this opportunity of offering my grateful acknowledgments to Mr. Carter and Mr. West, the Chief and Deputy Chief Engineers of the Madras Railway, for the great trouble they have taken in obtaining for the college thirty specimens of Indian timber used in building construction. Many of the specimens have been obtained from the West Coast, others from Ceylon, from Simla and Lahore. Each specimen is supplied in two sizes—one large for preservation in the College Museum, and one small for use in class instruction. Mr. West has also kindly procured for me twelve specimens of building stones used on the Madras Railway. These form the commencement of what will one day, I hope, prove a fine collection of Indian building stones.

23. *Employment of Passed Students.*—Of the students who passed out in May last, intimation has been received of the employment of ten overseers, seven draftsmen, and three surveyors. Recommendations have also been made of one supervisor, two overseers, six draftsmen, and six surveyors at the request of various officers requiring their services, and I conclude that a considerable proportion of the nominees has been appointed. Of the students of the Engineer class which passed out in December 1885, one, as already mentioned, has been posted to the Public Works Department as an Assistant Engineer, while the remaining seven have been appointed temporary overseers by the department to enable them to gain an insight into the details of practical work and thus to qualify themselves for higher positions.

It is well understood among passed students that the college assists them in obtaining employment; and the fact that but few applications have been received from them by the Principal is an indication that little difficulty is experienced in obtaining employment. The numerous advertisements gathered from the Government Gazette and from the local newspapers and posted on the college notice-board, afford confirmation of this view.

24. It is satisfactory to me to be able to report that the Madras Survey Department proposes to open its ranks to college students. It is in contemplation to entertain annually three or four passed men, Europeans or Eurasians being preferred, as Probationary Deputy Surveyors on Rs. 50 per mensem. If a soldier student is employed, he will join as a Probationary Head Surveyor on Rs. 100, drawing an outfit allowance as in the Public Works Department, and having his promotion to warrant rank governed by the rules affecting departments which own no fixed warrant establishment. Both classes will be eligible to rise to the grade of Sub-Assistant Superintendent on Rs. 250. Under these rules, Corporal

Moore of the batch of 1885, for whom employment could not be found in the Public Works Department, has already been appointed to the Survey, and two military students of the present batch will probably be nominated next month. They are destined to form, I trust, the nucleus of a semi-military class of upper subordinates which will doubtless prove as serviceable in the Survey as the corresponding class has done for a long series of years in the Public Works Department.

25. *General Remarks.*—This college has hitherto been singularly deficient in the cultivation of games and physical exercises, the chief reason being that the hours are exceptionally long and the course of study arduous. Under the new scheme, which provides for longer courses, the hours may be somewhat reduced, and leisure be thus found for gymnastics, cricket, and lawn-tennis. Application has been made to Government for the reservation of the land lying between the College and the Beach road as a cricket and recreation ground, and for a plot on the west side as a gymnasium.

26. I have only to add in conclusion that the conduct of the students has been excellent, that their attendance has been regular, and that the staff generally have heartily co-operated with me in laboring for the welfare of the institution. I trust that masters and students alike will enjoy and profit by their well-earned vacation, which commences to-morrow.

From Major W. H. COAKER, R.E., President, Board of Examiners, College of Engineering, to the Principal, College of Engineering, Madras, dated Ootacamund, 26th May 1886.

I HAVE the honor to forward herewith statement of results of the examination of the first class, second department, held in the beginning of this month.

2. The results appear to me to be very satisfactory, the total marks obtained being 60 per cent. of the maximum as compared with 55 per cent. last year. The percentages obtained in the different subjects compare as follows :—

	1885. per cent.	1886. per cent.
Mathematics	55	60
Civil Engineering...	49	53
Surveying and Levelling	62	65
Drawing and Estimating	56	65
Language	47	46
Total ...	55	60

It will be observed that in both years the marks in Surveying and Levelling, and in Drawing and Estimating, exceed the average percentage; that those in Mathematics correspond with the average; while those in Civil Engineering and Language are considerably below it.

3. Of the twenty-four students examined all gained the required number of marks for a pass, but one student having failed in Language, only twenty-three obtain certificates. Eleven students gained sufficient marks for certificates as Supervisor, but owing to one of these having failed to obtain the qualifying marks (35 per cent.) for this grade in language, only ten obtain the higher certificate. Thirteen students obtain certificates as Overseer. The average percentage of marks obtained corresponds to that required for the grade of Supervisor.

4. It is gratifying to note the good position taken by the five military students. Sergeant W. L. Emery heads the list with a percentage of 81·4, being first in Mathematics and in Surveying and Levelling; Corporal B. Reynolds stands third with 75 per cent. and takes the prizes for Civil Engineering and for Drawing and Estimating; Corporal P. King is fifth; Corporal J. W. Jones sixth; and Gunner J. Knox eighth.

The satisfactory examination passed by these men cannot fail to be regarded as highly creditable to them.

Of the other students, M. V. Kristnaswami Aiyar stands second with 76·5 per cent.; A. V. Kristna Menon is fourth with 74 per cent., and E. C. M. Mascarenhas is seventh.

The prize for Language is taken by V. Ramakristnayya.

THE average numbers on the rolls in the several classes for the last two years were as under :—

	1884-85.	1885-86.
Engineering classes	19	18
Engineer Subordinate classes	51	62
Draftsmen's classes ... ... }	55	{55
Surveyors' classes ... ... }		{40
Total ...	125	175

Though there was a fall of one student in the Engineer classes, the increase in the other classes, notably in the Draftmen's and Surveyors' classes, is very satisfactory.

2. The numbers for the same two years arranged according to the classes of the community are—

	1884-85.	1885-86.
Europeans and Eurasians	29	29
Brahmans	49	68
Hindus other than Brahmans	33	60
Native Christians	11	14
Muhammadans	1	3
Others	2	1
Total ...	125	175

It is to be regretted that the number of Europeans and Eurasians shows no advance. The increase in the number of Muhammadans is encouraging.

3. The only change in the establishment during the year was the appointment of Mr. H. Narasinga Rau, B.A., to the post of Telugu Munshi, rendered vacant by the retirement of the former Munshi on the last day of the preceding year. The transfer of Mr. Kenny, First Assistant Master, and the retirement of the Tamil Pandit, belong to the transactions of the current official year, and should therefore find place in the next report. The Acting Director is, however, glad to note the favorable mention made by the Principal of the above two officers.

4. In paragraph 19 of Proceedings No. 4932 of the 18th July 1885 it was pointed out that the year 1884-85 marked "an important era in the history of the institution, the higher ranks of the Public Works Department having been systematically opened for the first time to its students in accordance with the orders of the Supreme Government guaranteeing one such appointment annually to the college." But much more worthy of special notice is the year now under review, which has witnessed the reorganization * of the college, a brief account of which is given by the Principal. The designation of the institution has been changed to that of "College of Engineering." The courses of study and rules for admission, as well as the appointments thrown open to the successful candidates under the new scheme, are also briefly summarized by the Principal. Partial effect has been given during the year under report to the new scheme, which will probably be introduced in its entirety during the current year. The Principal strongly advocates that in consideration of the "great stride in the progress of the technical education afforded by the institution," an addition to the staff and the accommodation should be provided immediately. The Acting Director observes that in Governm ent Order (Educational), No. 328, dated 27th May 1886, Government admitted the necessity for the reorganization of the staff of the college and stated that the Secretary of State would be addressed. The question of increased accommodation was disposed of in Government Order (Educational), No. 329, dated 27th May 1886. It is hoped that the additional buildings will soon be put in hand and completed, and that the sanction of the Secretary of State may

* Government Order (Educational), No. 443, dated 16th July 1885.
Government Order (Educational), No. 7, dated 7th January 1886.
Government Order (Educational), No. 328, dated 27th May 1886.

be obtained at an early date, so that the new scheme may be carried out to its full extent.

5. During the year under report Government were pleased to sanction the appointment of a Board of Examiners to conduct the final examinations of the two senior departments. The Board examined the Engineer class in December 1885 and the Engineer Subordinate class in May 1886. The final examinations of the Draftsmen's and Surveyors' classes were conducted by the College staff, but they also are to be transferred ultimately to the Board.

6. The results of the examination of the senior division of the Engineer class were satisfactory. Of the eight students who were examined by the Board, all were successful and obtained diplomas as Assistant Engineers. Mr. R. A. Srinivasa Aiyangar, B.A., took the first place with honors and thus secured the guaranteed appointment to the Engineer establishment of the Public Works Department. He is to be congratulated on having won the prize offered by Government. He will doubtless prove himself worthy of the honor conferred on him. The percentages of marks obtained by the successful candidates ranged from 84·3 to 51. An independent candidate, who was formerly a student of the college, appeared for the examination, but was absent during the greater part of it. All the above ten students appeared for the B.C.E. Examination, but only three were successful, one in the second and two in the third class, their order being the same as in the examination by the Board.

7. The strength of the present senior division is stated to be ten, and of the junior eight. It is satisfactory to note that the senior division maintained its numbers and that the progress of the students as tested by the sessional examination is favorable.

8. The senior division of the Engineer Subordinates' class contained twenty-fur students. All of them were examined by the Board, and the Acting Director notes with much pleasure that the results are characterized as very satisfactory. With the exception of one, who failed in language, all were successful. Thirteen students obtained certificates as supervisors, while the remaining ten took certificates as overseers. The favorable mention made of the good position taken by the five military students is gratifying.

9. On a comparison of the results of the examination of the year under report with the average marks of the last five years, it is observed that there has been a decided improvement in every subject, notably in Engineering and Drawing. Mathematics, which showed a fall of 2 per cent. in the preceding year, now shows a rise of 3 per cent. These very satisfactory results bear testimony, as Captain Love says, to the good work done by the teaching staff and the better material which the teachers had to work upon.

10. The strength of the junior division of the Engineer Subordinates' class was thirty-eight against twenty-four. The sessional examination is reported to have been satisfactory. The Acting Director is glad to observe that the first place was occupied by a Muhammadan. The formation of a new division of this class belongs to the transactions of the current year and will be dealt with in the next report.

11. The senior division of the Draftsmen's class was nineteen strong against nine in 1884-85. All the students were examined with satisfactory results. Four secured certificates of the first class, five of the second, and nine of the third class. Only one failed. The marks gained by the student who headed the list of successful candidates were 90 per cent. of the total marks. The second division consisted of twenty-six students against twenty-one in the preceding year. The results of the sessional examination were satisfactory. The strength of the third division formed in January last under the new rules was twenty. The Acting Director notes with pleasure the Principal's remarks that the results of the examination in the Draftsmen's class were very creditable to Mr. Pope, the instructor.

12. The senior division of the Surveyors' class consisted of twelve students against seven. Eleven of these secured certificates as surveyors, two of the first class, five of the second, and four of the third class. It is satisfactory to observe that one of the two students who obtained first-class certificates was a Muhammadan. The remaining student is reported to have appeared for the Overseer's Certificate Examination as an independent candidate and to have succeeded in passing. The strength of the second division was twenty-three against fifteen. The results of the sessional examination were satisfactory. The third division formed in January last under the new rules contained ten students.

Two students of the junior division are reported to have volunteered for the final examination as independent candidates and to have succeeded in passing, both gaining second-class certificates.

The results, as a whole, of the Surveyors' class are stated to be above the average and are creditable to the instructor, Mr. Campbell.

13. The number of independent candidates who appeared for examination for certificates was 127 against 69 in the preceding year. This increase is evidence of the value set upon the certificates given by the college. Of the above candidates, two sought the Overseers' certificate, ninety-seven that of Draftsmen, and twenty-eight that of Surveyor.

14. The Acting Director regrets to observe that though several applications had been received for admission into the Sub-Overseers' and Maistries' class, the Principal was unable to arrange for the formation of the class owing to the want of teachers and accommodation.

15. The proposals regarding the training of Probationary Assistant Superintendents of Revenue Survey were sanctioned in Government Order, Revenue, No. 115, dated 12th February 1886.

16. Five military students were passing out. Three were in the college, one was to join from Bangalore after passing the vernacular examination, and four were to present themselves for the entrance examination.

17. It is satisfactory to observe that good progress has been made by the students of the photographic class.

18. The condition of the library is satisfactory; 216 volumes were added during the year and 2,603 were taken out.

19. The Acting Director is glad that the Principal is taking steps for collecting materials for the College Museum, and he is indebted to Messrs. Carter and West of the Madras Railway for their kindness in obtaining specimens of Indian timbers and of buildings stones.

20. It is encouraging to observe that the passed students of the college seem to experience little difficulty in procuring employment.

21. A new field of employment has also been opened in the Madras Survey Department by the appointment, as an experimental measure, of the best qualified of the passed students of the Survey class as Probationary Deputy Surveyors.

Government Order (Educational), No. 654, dated 26th October 1885.

One of the military students who passed in 1885 has been appointed to the Survey and two will probably be nominated in the current year. Measures have been taken for providing the college with a gymnasium and a cricket and recreation ground. The proposal made by the Principal for the reservation of a cricket and recreation ground and of an additional tennis ground for the students have been referred by Government to the Public Works Department (Government Order, Educational, No. 329, dated 27th May 1886).

22. The Acting Director is glad to note the excellent conduct of the students as brought to notice by Captain Love, and the hearty co-operation he has received from the teaching staff generally.

23. As requested in para. 5 of the Principal's letter, No. 163-C, of the 31st May 1886, the whole of the marks obtained by the students in the several examinations will be printed as an appendix to this review.

(True Copies and Extract.)

(Signed) D. DUNCAN,
Ag. Director of Public Instruction.

To the Principal, College of Engineering.
Copy to the Principals of Government First-grade Colleges.
„ Principal, Teachers' College.

ORDER—dated 29th September 1886, No. 619, Educational.

Ordered that the report be forwarded to the India Office.

(True Extract.)

E. F. WEBSTER,
Chief Secretary.

To the Director of Public Instruction.
„ Public Works Department.

Ed. T. O'Connor.

No 2734 Ind/ 16 Oct/86

Recorded

(sd) J.O.H.

Govt. of {1886} Madras.

EDUCATIONAL.

Issued

Recd. *Encl.*

G.O., 29th Sept. 1886, No. 619.

B-2734 16-10-86

SEPTEMBER.

College of Engineering.

Forwarding to the Secretary of State report on the working of the — for the year 1885-86.

GOVERNMENT OF MADRAS.

EDUCATIONAL DEPARTMENT.

READ—the following paper:—

From D. DUNCAN, Esq., M.A., D.Sc., Acting Director of Public Instruction, to the Chief Secretary to Government, dated Madras, 30th August 1886, No. 5937.

I have the honor to submit three copies of the report on the working of the College of Engineering, Madras, for 1885-86, with my review thereon.

ENCLOSURE.

PROCEEDINGS OF THE DIRECTOR OF PUBLIC INSTRUCTION, dated 20th August 1886. No. 5779.

Madras College of Engineering.

Read the following letter from the Principal, Civil Engineering College, to the Director of Public Instruction, dated Madras, 31st May 1886, No. 162-C.

I HAVE the honor to submit the following report on the working of the College of Engineering during the past year, and on the results of examinations for certificates which have been held during that period.

2. *Numbers.*—The average numbers on the rolls have been:—

Engineer classes	18
Engineer Subordinates' classes	62
Draftsmen's classes	55
Surveyors' classes	40
Total	175

The numbers arranged by classes of the community are:—

Europeans and Eurasians	29
Brahmans	68
Hindus other than Brahmans	60
Native Christians	14
Mussalmans	3
Others	1
Total	175

3. *Changes in Establishment.*—Mr. H. Narasinga Rau, B.A., was appointed on 17th August 1885 to fill the vacancy caused by the retirement of the Telugu Munshi, Mr. Lakshminarasayya Pantulu, which was alluded to in last year's report. With this exception, the staff has remained unchanged throughout the session. From the present date, however, Mr. M. Kenny, B.A., First Assistant Master, is transferred to Berhampore College, and Mr. Rajagopala Mudaliyar, the Tamil Munshi, after a period of twenty-seven years' uninterrupted duty, retires from the service. Under Mr. Kenny, who joined the college in August 1880, the senior classes have always made good progress in mathematics. Mr. Rajagopala Mudaliyar entered the college in 1859, and attained the age of 55 in 1877; but extensions of service have

from time to time been sanctioned, which have enabled him to remain at his post until the close of the present session. I cannot permit him to leave without expressing appreciation of the excellent work which, during a long series of years, he has done at this college.

4. *Reorganization of the College.*—The year is memorable as heralding a reorganization of the institution which has been under consideration since 1880. In that year, Colonel Macdonald, the Director of Public Instruction, suggested the desirableness of introducing changes based on the scheme which had then lately been approved by the Honorable the Lieutenant-Governor of Bengal for the establishment of an Engineering College at Calcutta. The Madras Government referred the matter to a committee consisting of Engineers of the Public Works Department, the Railways, and Harbour Works, and of Educational officers, presided over by Colonel Shaw-Stewart, R.E. The committee recognised the principle that the college should train men not for the Public Works Department only, but for the country generally; and they submitted reports in 1881 and 1882, advising an increase in the theoretical courses of instruction to admit of Mechanical as well as Civil Engineering subjects being introduced, and the establishment of practical courses to fit all passed students for immediate employment on works, including those who might not be appointed to the Government service. After considerable discussion and criticism by the heads of the Public Works and Educational Departments, the detailed recommendations of the committee were adopted with slight modifications, and the reorganization scheme as finally approved was sanctioned in July 1885, and ordered to be introduced from 1st January of the current year. The classes to be formed are for—

(1) Civil Engineers.
(2) Mechanical Engineers.
(3) Engineer Subordinates.
(4) Draftsmen.
(5) Surveyors.
(6) Sub-Overseers, Maistries and Artizans.

The designation of the institution has been changed from *Civil Engineering College* to *College of Engineering*, so as to embrace the mechanical branches of the profession. The theoretical courses will extend over three years for Engineers, for two and a half years for Engineer Subordinates, and for two years for Draftsmen and Surveyors; and the times of admission will be so adjusted that the final examinations of all classes will take place simultaneously in December. The practical courses will comprise a period of workshop training and a period on Engineering works in progress, and will be undergone by the Engineer and Engineer Subordinates' classes. The details of the practical courses are, however, not yet settled.

Admission to the Engineer and Engineer Subordinates' classes is regulated by competitive examination, open, under restrictions as to age, health, &c., to persons who have passed the First Arts and Matriculation Examinations respectively of an Indian University; the classes for Draftsmen and Surveyors are open to persons who have passed the Middle School Examination; while that for Sub-Overseers and Maistries is reserved for the sons of artizans and for youths who have had practical training in the building trades. Non-commissioned officers and soldiers of British Regiments are eligible, as heretofore, for admission to the Engineer Subordinates' class, but they will undergo their probationary year of instruction at the college instead of at Bangalore.

The theoretical courses for the different classes will comprise some or all of the following branches:—Mathematics, Physical Science, Civil and Mechanical Engineering, Surveying, Drawing, and Vernacular Language. Examinations of students will take place as a rule annually, and the marks gained will count towards the final total. All the examinations will be conducted by a Board of Examiners appointed by Government. The rates of fee payment for the theoretical courses have been raised; but no fees will be demanded for the practical courses, and, during a portion of the latter, subsistence allowances will be paid to the students. Seven scholarships, ranging from Rs. 30 to Rs. 8 per mensem, are open to students for competition.

One appointment annually as Assistant Engineer in the Public Works Department, as well as a certain number of Supervisorships, will be conferred annually on passed students of the Engineer class. Overseerships in the department are open to those of the Engineer Subordinates' class, appointments as Draftsmen to those of the Draftsmen's class, while passed Surveyors are eligible for the Public Works and Madras Survey Departments.

5. *Requirements.*—From this brief sketch of the new scheme, it will be perceived that a great stride in the progress of the technical education afforded by this institution is about to be made. Additional classes, longer courses, and new subjects cannot, however, be introduced without the provision of a larger staff and more extended accommodation. Suitable lecture-rooms and a laboratory are needed; a museum, a drawing office, and examination hall must be provided; and a reinforcement of the staff is urgently required. Full proposals have been submitted in connexion with these wants, but I am not yet in a position to report on the steps which are to be taken to supply them. In January, classes of (1) Engineers, (2) Draftsmen, and (3) Surveyors were formed under the new rules, and in August a class of Engineer Subordinates will be established. At the present moment, therefore, the old and new courses of study progress side by side, though with unequal steps. Up to the present date it has been found possible to meet most of the earlier needs of the newly formed classes; but I assert in the most positive terms that, without the immediate provision of some additional staff and accommodation, the requirements of the new scheme cannot continue to be carried out.

6. *Examining Agency.*—Before proceeding to report on the work executed by the various classes during the year under review, I have to refer to the remarks made in last year's report on the College Examining Agency. In response to the arguments offered, Government appointed a Board of Examiners to conduct the final examinations of the two senior departments. Their duties commenced in December last with the examination of the Engineer class, and they continued during the current month with that of the Engineer Subordinates' class. The final examinations of the Draftsmen's and Surveyors' classes are still conducted by the College staff, though the new rules contemplate their ultimate transfer to the Board.

7. *Engineer Classes.*—In December 1885, the senior class of eight students was examined by the Board, with the result that all the candidates obtained diplomas as Assistant Engineer. The first man, R. A. Srinivasa Aiyangar, B.A., passed with honors, gaining 84·3 per cent. of the total marks. His position secured for him the guaranteed appointment to the Engineer establishment of the Public Works Department, and he was posted to the Godávari Eastern Division on 1st April last. My knowledge of his character and abilities leads me to expect that he will prove a good servant to the Government.

The next three candidates, V. Aiyaswami Aiyar, B.A., R. V. Subrahmanya Aiyar, and G. V. Subrahmanya Aiyar, passed with credit, with percentages ranging from 71 to 67. The remaining four students, M. A. Ananthalwar, B.A., D. V. Jagannathachari, C. Madhava Rau, and T. Ramaswami Aiyangar, obtained an ordinary pass with percentages ranging from 64 to 51.

One independent candidate, who was formerly a student of the college, also presented himself, but was absent during the greater part of the examination.

In January, the eight students above referred to appeared for the University examination for the degree of Bachelor of Civil Engineering. The following three were successful:—

R. A. Srinivasa Aiyangar, B.A.
V. Aiyaswami Aiyar, B.A.
R. V. Subrahmanya Aiyar.

8. The present senior division consists of ten students and the junior of eight. The latter were admitted by a competitive examination in December last under the new rules, the candidate at the head of the list, R. Srinivasa Aiyangar, B.A., winning the scholarship of Rs. 30 per mensem. This will be re-competed for by

the entered students in December of the current year. Both divisions have just undergone a sessional examination, at which satisfactory progress has been indicated. In the first division, R. Gopala Aiyar, B.A., stands easily first, winning the prizes for Mathematics and Engineering—an aneroid barometer and planimeter respectively. The prize for Drawing and Surveying—an ellipsograph—is secured by A. V. Panchapakesa Aiyar, B.A.

In the second division, R. Srinivasa Aiyangar, B.A., heads the list, and wins the prize for general proficiency, consisting of an Abney's level.

9. *Engineer Subordinates' Class.*—The senior division of this class contains twenty-four students who have just undergone examination at the hands of the Board of Examiners for certificates of qualification as Supervisor and Overseer. The remarks of the Board, which form an appendix to this report, are to the effect that the results are very satisfactory, the average total marks being 60 per cent. of the maximum, and that the five military students who occupy the first, third, fifth, sixth and eighth places on the list have done work which is especially creditable to them. Of the twenty-four students examined, ten obtain certificates as Supervisor, having gained not less than 35 per cent. of the marks in each subject and 60 per cent. of the total; thirteen take certificates as Overseer, the qualification for which is 25 per cent. in each subject and 40 per cent. of the total; and one fails.

10. Corporal W. L. Emery, Royal Scots Fusiliers, stands at the head of the list with 81 per cent. of the total marks. He obtains a Supervisor's certificate and carries off the following prizes :— For distinguished proficiency, the Royal Engineer Officer's prize; for mathematics, a case of drawing instruments; for surveying, a case of spring bows.

The second place is taken by M. V. Krishnaswami Aiyar with 76 per cent. of the total marks. He secures a Supervisor's certificate.

Lance-Corporal B. Reynolds, 12th Royal Lancers, occupies the third place with 75 per cent, taking a Supervisor's certificate and gaining the following prizes :— For Engineering, a lever watch; for drawing, a parallel rule.

The following students also gain certificates as Supervisor :—

A. Krishna Menon.	Gunner J. Knox, Royal Horse Artillery.
Lance-Corporal P. King, Hampshire Regiment.	G. Padmanabha Aiyar.
	A. Narayanaswami Nayudu.
E. C. M. Mascarenhas.	M. Gnanaprakasa Pillai.

Thirteen others obtain certificates as Overseer, one of them, V. Ramakrishnayya, winning the prize for Vernacular Language.

11. On comparing the results of the examination with the average marks of the last five years, it will be found that there has been—

A rise of 3 per cent. in Mathematics.
„ 6 „ „ Engineering.
„ 3 „ „ Surveying.
„ 12 „ „ Drawing.
An unchanged percentage in Language.
A rise of 6 per cent. in the total.

I attribute this decided improvement mainly to the circumstance of having better material to work on; but I consider that the substantial increases under Engineering and Drawing are due also to the conscientious and painstaking manner in which the 2nd, 3rd and 4th Assistant Masters, Sub-Conductor Cames, and Messrs. Hyde and Hamilton have carried out the duties entrusted to them.

12. The junior division of the Engineer Subordinates' class contains thirty-eight students, who have just undergone a satisfactory sessional examination. Mahomed Sikandar occupies the first place with 81 per cent. of the total marks, and gains the prize for general proficiency—a pedometer.

The next four students in order of merit are—

F. A. Pope	A. P. Doll
A. V. Krishnaswami Pillai	W. Clay

and to these are awarded scholarships of Rs. 15 each per mensem tenable during the ensuing year.

13. A new division of this class will be formed in August. The entrance examination was held by the Board of Examiners on 3rd May, when thirty-eight Matriculates presented themselves. The results have not yet been published.

14. *Draftsmen's Class.*—The senior division of nineteen students has just undergone examination for certificates as Draftsman and Estimator. Four secure certificates of the first class, five of the second class, and nine of the third class, while one fails. A. Thambu Chetti stands at the head of the division with 90 per cent. of the total marks, and gains the prize for drawing, a case of proportional compasses. The remaining winners of first-class certificates are—

E. A. Sivakrishnaswami Aiyar.	A. V. Ramachandra Aiyar.
M. Angamuttu Mudaliyar.	

The second division contains twenty-six students, who have undergone a satisfactory sessional examination. Scholarships of Rs. 8 per mensem are awarded to the following students of this division :—

J. C. A. Ellis.	P. Ramaswami Nayaker.
M. Sankaranarayana Pillai.	R. Srinivasa Aiyar.
J. D. Francis.	

The third division formed in January last under the new rules contains twenty students.

I consider that the results of the examinations in the Draftsmen's class are very creditable to the instructor, Mr. Pope.

15. *Surveyors' Class.*—The senior division consists of twelve students, eleven of whom secure certificates as Surveyor, viz., two of the first class, Saiyid Raza Husain and J. M. Berlie, five of the second class and four of the third class. The remaining member of the class, M. T. V. Ramanujayya, one of its best students, appeared as an independent candidate for the Overseer's Certificate examination, and was successful. The prize for surveying is won by Saiyid Raza Husain, who stands first with 85 per cent. of the total marks. The average percentage of marks for this division is 69.

The second division contains twenty-three students, who have undergone a satisfactory sessional examination. Scholarships of Rs. 8 per mensem are awarded to the following students :—

M. S. Swaminatha Aiyar.	E. Stuart.
C. C. Somasundara Mudaliyar.	V. Lakshmana Rau.
A. Pereira.	

The third division, formed in January last under the new rules, contains ten students.

Two of the students of the junior divisions, H. R. White and G. Haller, volunteered for the final examination as independent candidates, and were successful, both gaining second-class certificates.

The results obtained by the Surveyors' class are above the average, and reflect credit on Mr. Campbell's instruction.

16. *Independent Candidates.*—Candidates, not belonging to the senior divisions of the different college classes, presented themselves, to the number of one hundred and twenty-seven, for examination for certificates, viz., two as Overseer, ninety-seven as Draftsmen, and twenty-eight as Surveyor. The majority of these are employed in the Public Works Department and Local Fund Boards, and appear for the examination with the view of obtaining a higher class of certificate than they already possess. The results of the examination are not yet published.

17. *Sub-Overseers' and Maistries' Class.*—This class, for admission to which several applications have been received, should have been formed in January last. It cannot, however, be established until additional staff and accommodation have been provided.

18. *Proposed Survey Probationers' Class.*—The Superintendent, Madras Survey, is desirous that the probationers for the superior establishment of his department should undergo a course of training in mathematics at this college. It is proposed that a special master be entertained, and that all charges connected with the instruction and examination of the class be defrayed by the fees of the candidates. The class is not likely to consist of more than four students, and the course of study will last from six months to a year.

19. *Military Students.*—Five men are now passing out of the college, three are in the present junior division of the Engineer Subordinates' class, one is at Bangalore prepared to join the college after passing an examination in vernacular language, and four candidates will present themselves for the entrance examination in July.

20. *Photographic Class.*—This class consists of twelve students selected from the Engineer and Engineer Subordinates' classes. Good progress has been made under Mr. Hyde's instruction, and some of the students' work is exhibited on the tables to-day.

21. *Library.*—During the year 216 volumes have been added to the library, which now contains 2,302 volumes. The issues of books to masters and students were 2,603, having increased just ninefold during the last six years.

22. *Apparatus, &c.*—A fresh supply of surveying instruments has been received from England, and a model of a Stoney's sifter has been made locally. I take this opportunity of offering my grateful acknowledgments to Mr. Carter and Mr. West, the Chief and Deputy Chief Engineers of the Madras Railway, for the great trouble they have taken in obtaining for the college thirty specimens of Indian timber used in building construction. Many of the specimens have been obtained from the West Coast, others from Ceylon, from Simla and Lahore. Each specimen is supplied in two sizes—one large for preservation in the College Museum, and one small for use in class instruction. Mr. West has also kindly procured for me twelve specimens of building stones used on the Madras Railway. These form the commencement of what will one day, I hope, prove a fine collection of Indian building stones.

23. *Employment of Passed Students.*—Of the students who passed out in May last, intimation has been received of the employment of ten overseers, seven draftsmen, and three surveyors. Recommendations have also been made of one supervisor, two overseers, six draftsmen, and six surveyors at the request of various officers requiring their services, and I conclude that a considerable proportion of the nominees has been appointed. Of the students of the Engineer class which passed out in December 1885, one, as already mentioned, has been posted to the Public Works Department as an Assistant Engineer, while the remaining seven have been appointed temporary overseers by the department to enable them to gain an insight into the details of practical work and thus to qualify themselves for higher positions.

It is well understood among passed students that the college assists them in obtaining employment; and the fact that but few applications have been received from them by the Principal is an indication that little difficulty is experienced in obtaining employment. The numerous advertisements gathered from the Government Gazette and from the local newspapers and posted on the college notice-board, afford confirmation of this view.

24. It is satisfactory to me to be able to report that the Madras Survey Department proposes to open its ranks to college students. It is in contemplation to entertain annually three or four passed men, Europeans or Eurasians being preferred, as Probationary Deputy Surveyors on Rs. 50 per mensem. If a soldier student is employed, he will join as a Probationary Head Surveyor on Rs. 100, drawing an outfit allowance as in the Public Works Department, and having his promotion to warrant rank governed by the rules affecting departments which own no fixed warrant establishment. Both classes will be eligible to rise to the grade of Sub-Assistant Superintendent on Rs. 250. Under these rules, Corporal

Moore of the batch of 1885, for whom employment could not be found in the Public Works Department, has already been appointed to the Survey, and two military students of the present batch will probably be nominated next month. They are destined to form, I trust, the nucleus of a semi-military class of upper subordinates which will doubtless prove as serviceable in the Survey as the corresponding class has done for a long series of years in the Public Works Department.

25. *General Remarks.*—This college has hitherto been singularly deficient in the cultivation of games and physical exercises, the chief reason being that the hours are exceptionally long and the course of study arduous. Under the new scheme, which provides for longer courses, the hours may be somewhat reduced, and leisure be thus found for gymnastics, cricket, and lawn-tennis. Application has been made to Government for the reservation of the land lying between the College and the Beach road as a cricket and recreation ground, and for a plot on the west side as a gymnasium.

26. I have only to add in conclusion that the conduct of the students has been excellent, that their attendance has been regular, and that the staff generally have heartily co-operated with me in laboring for the welfare of the institution. I trust that masters and students alike will enjoy and profit by their well-earned vacation, which commences to-morrow.

From Major W. H. COAKER, R.E., President, Board of Examiners, College of Engineering, to the Principal, College of Engineering, Madras, dated Ootacamund, 26th May 1886.

I HAVE the honor to forward herewith statement of results of the examination of the first class, second department, held in the beginning of this month.

2. The results appear to me to be very satisfactory, the total marks obtained being 60 per cent. of the maximum as compared with 55 per cent. last year. The percentages obtained in the different subjects compare as follows :—

	1885. per cent.	1886. per cent.
Mathematics	55	60
Civil Engineering...	49	53
Surveying and Levelling	62	65
Drawing and Estimating	56	65
Language	47	46
Total ...	55	60

It will be observed that in both years the marks in Surveying and Levelling, and in Drawing and Estimating, exceed the average percentage; that those in Mathematics correspond with the average; while those in Civil Engineering and Language are considerably below it.

3. Of the twenty-four students examined all gained the required number of marks for a pass, but one student having failed in Language, only twenty-three obtain certificates. Eleven students gained sufficient marks for certificates as Supervisor, but owing to one of these having failed to obtain the qualifying marks (35 per cent.) for this grade in language, only ten obtain the higher certificate. Thirteen students obtain certificates as Overseer. The average percentage of marks obtained corresponds to that required for the grade of Supervisor.

4. It is gratifying to note the good position taken by the five military students. Sergeant W. L. Emery heads the list with a percentage of 81·4, being first in Mathematics and in Surveying and Levelling; Corporal B. Reynolds stands third with 75 per cent. and takes the prizes for Civil Engineering and for Drawing and Estimating; Corporal P. King is fifth; Corporal J. W. Jones sixth; and Gunner J. Knox eighth.

The satisfactory examination passed by these men cannot fail to be regarded as highly creditable to them.

Of the other students, M. V. Kristnaswami Aiyar stands second with 76·5 per cent.; A. V. Kristna Menon is fourth with 74 per cent., and E. C. M. Mascarenhas is seventh.

The prize for Language is taken by V. Ramakristnayya.

THE average numbers on the rolls in the several classes for the last two years were as under:—

	1884-85.	1885-86.
Engineering classes	19	18
Engineer Subordinate classes	51	62
Draftsmen's classes ... ... }	55	55
Surveyors' classes ... ... }		40
Total ...	125	175

Though there was a fall of one student in the Engineer classes, the increase in the other classes, notably in the Draftmen's and Surveyors' classes, is very satisfactory.

2. The numbers for the same two years arranged according to the classes of the community are—

	1884-85.	1885-86.
Europeans and Eurasians	29	29
Brahmans	49	68
Hindus other than Brahmans	33	60
Native Christians	11	14
Muhammadans	1	3
Others	2	1
Total ...	125	175

It is to be regretted that the number of Europeans and Eurasians shows no advance. The increase in the number of Muhammadans is encouraging.

3. The only change in the establishment during the year was the appointment of Mr. H. Narasinga Rau, B.A., to the post of Telugu Munshi, rendered vacant by the retirement of the former Munshi on the last day of the preceding year. The transfer of Mr. Kenny, First Assistant Master, and the retirement of the Tamil Pandit, belong to the transactions of the current official year, and should therefore find place in the next report. The Acting Director is, however, glad to note the favorable mention made by the Principal of the above two officers.

4. In paragraph 19 of Proceedings No. 4932 of the 18th July 1885 it was pointed out that the year 1884-85 marked "an important era in the history of the institution, the higher ranks of the Public Works Department having been systematically opened for the first time to its students in accordance with the orders of the Supreme Government guaranteeing one such appointment annually to the college." But much more worthy of special notice is the year now under review, which has witnessed the reorganization * of the college, a brief account of which is given by the Principal. The designation of the institution has been changed to that of "College of Engineering." The courses of study and rules for admission, as well as the appointments thrown open to the successful candidates under the new scheme, are also briefly summarized by the Principal. Partial effect has been given during the year under report to the new scheme, which will probably be introduced in its entirety during the current year. The Principal strongly advocates that in consideration of the "great stride in the progress of the technical education afforded by the institution," an addition to the staff and the accommodation should be provided immediately. The Acting Director observes that in Governm ent Order (Educational), No. 328, dated 27th May 1886, Government admitted the necessity for the reorganization of the staff of the college and stated that the Secretary of State would be addressed. The question of increased accommodation was disposed of in Government Order (Educational), No. 329, dated 27th May 1886. It is hoped that the additional buildings will soon be put in hand and completed, and that the sanction of the Secretary of State may

* Government Order (Educational), No. 443, dated 16th July 1885.
Government Order (Educational), No. 7, dated 7th January 1886.
Government Order (Educational), No. 328, dated 27th May 1886.

be obtained at an early date, so that the new scheme may be carried out to its full extent.

5. During the year under report Government were pleased to sanction the appointment of a Board of Examiners to conduct the final examinations of the two senior departments. The Board examined the Engineer class in December 1885 and the Engineer Subordinate class in May 1886. The final examinations of the Draftsmen's and Surveyors' classes were conducted by the College staff, but they also are to be transferred ultimately to the Board.

6. The results of the examination of the senior division of the Engineer class were satisfactory. Of the eight students who were examined by the Board, all were successful and obtained diplomas as Assistant Engineers. Mr. R. A. Srinivasa Aiyangar, B.A., took the first place with honors and thus secured the guaranteed appointment to the Engineer establishment of the Public Works Department. He is to be congratulated on having won the prize offered by Government. He will doubtless prove himself worthy of the honor conferred on him. The percentages of marks obtained by the successful candidates ranged from 84·3 to 51. An independent candidate, who was formerly a student of the college, appeared for the examination, but was absent during the greater part of it. All the above ten students appeared for the B.C.E. Examination, but only three were successful, one in the second and two in the third class, their order being the same as in the examination by the Board.

7. The strength of the present senior division is stated to be ten, and of the junior eight. It is satisfactory to note that the senior division maintained its numbers and that the progress of the students as tested by the sessional examination is favorable.

8. The senior division of the Engineer Subordinates' class contained twenty-fur students. All of them were examined by the Board, and the Acting Director notes with much pleasure that the results are characterized as very satisfactory. With the exception of one, who failed in language, all were successful. Thirteen students obtained certificates as supervisors, while the remaining ten took certificates as overseers. The favorable mention made of the good position taken by the five military students is gratifying.

9. On a comparison of the results of the examination of the year under report with the average marks of the last five years, it is observed that there has been a decided improvement in every subject, notably in Engineering and Drawing. Mathematics, which showed a fall of 2 per cent. in the preceding year, now shows a rise of 3 per cent. These very satisfactory results bear testimony, as Captain Love says, to the good work done by the teaching staff and the better material which the teachers had to work upon.

10. The strength of the junior division of the Engineer Subordinates' class was thirty-eight against twenty-four. The sessional examination is reported to have been satisfactory. The Acting Director is glad to observe that the first place was occupied by a Muhammadan. The formation of a new division of this class belongs to the transactions of the current year and will be dealt with in the next report.

11. The senior division of the Draftsmen's class was nineteen strong against nine in 1884-85. All the students were examined with satisfactory results. Four secured certificates of the first class, five of the second, and nine of the third class. Only one failed. The marks gained by the student who headed the list of successful candidates were 90 per cent. of the total marks. The second division consisted of twenty-six students against twenty-one in the preceding year. The results of the sessional examination were satisfactory. The strength of the third division formed in January last under the new rules was twenty. The Acting Director notes with pleasure the Principal's remarks that the results of the examination in the Draftsmen's class were very creditable to Mr. Pope, the instructor.

12. The senior division of the Surveyors' class consisted of twelve students against seven. Eleven of these secured certificates as surveyors, two of the first class, five of the second, and four of the third class. It is satisfactory to observe that one of the two students who obtained first-class certificates was a Muhammadan. The remaining student is reported to have appeared for the Overseer's Certificate Examination as an independent candidate and to have succeeded in passing. The strength of the second division was twenty-three against fifteen. The results of the sessional examination were satisfactory. The third division formed in January last under the new rules contained ten students.

Two students of the junior division are reported to have volunteered for the final examination as independent candidates and to have succeeded in passing, both gaining second-class certificates.

The results, as a whole, of the Surveyors' class are stated to be above the average and are creditable to the instructor, Mr. Campbell.

13. The number of independent candidates who appeared for examination for certificates was 127 against 69 in the preceding year. This increase is evidence of the value set upon the certificates given by the college. Of the above candidates, two sought the Overseers' certificate, ninety-seven that of Draftsmen, and twenty-eight that of Surveyor.

14. The Acting Director regrets to observe that though several applications had been received for admission into the Sub-Overseers' and Maistries' class, the Principal was unable to arrange for the formation of the class owing to the want of teachers and accommodation.

15. The proposals regarding the training of Probationary Assistant Superintendents of Revenue Survey were sanctioned in Government Order, Revenue, No. 115, dated 12th February 1886.

16. Five military students were passing out. Three were in the college, one was to join from Bangalore after passing the vernacular examination, and four were to present themselves for the entrance examination.

17. It is satisfactory to observe that good progress has been made by the students of the photographic class.

18. The condition of the library is satisfactory; 216 volumes were added during the year and 2,603 were taken out.

19. The Acting Director is glad that the Principal is taking steps for collecting materials for the College Museum, and he is indebted to Messrs. Carter and West of the Madras Railway for their kindness in obtaining specimens of Indian timbers and of buildings stones.

20. It is encouraging to observe that the passed students of the college seem to experience little difficulty in procuring employment.

21. A new field of employment has also been opened in the Madras Survey Department by the appointment, as an experimental measure, of the best qualified of the passed students of the Survey class as Probationary Deputy Surveyors.

Government Order (Educational), No. 654, dated 26th October 1885.

One of the military students who passed in 1885 has been appointed to the Survey and two will probably be nominated in the current year. Measures have been taken for providing the college with a gymnasium and a cricket and recreation ground. The proposal made by the Principal for the reservation of a cricket and recreation ground and of an additional tennis ground for the students have been referred by Government to the Public Works Department (Government Order, Educational, No. 329, dated 27th May 1886).

22. The Acting Director is glad to note the excellent conduct of the students as brought to notice by Captain Love, and the hearty co-operation he has received from the teaching staff generally.

23. As requested in para. 5 of the Principal's letter, No. 163-C, of the 31st May 1886, the whole of the marks obtained by the students in the several examinations will be printed as an appendix to this review.

(True Copies and Extract.)

(Signed) D. DUNCAN,
Ag. Director of Public Instruction.

To the Principal, College of Engineering.
Copy to the Principals of Government First-grade Colleges.
„ Principal, Teachers' College.

Order—dated 29th September 1886, No. 619, Educational.

Ordered that the report be forwarded to the India Office.

(True Extract.)

Chief Secretary.

To the Director of Public Instruction.
„ Public Works Department.

Exd. T. O'Connor.

1990-W 27.8.85
3056-W 12.12.84
2233-W 11.9.84
3021-W 24.10.83.

No 2734 way 16 Oct/86

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P.W.C. No 8054

Govt. of {1886} Madras.

EDUCATIONAL.

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Issued

Recd. 15.10.86 *Encl.*

G.O., 29th Sept. 1886, No. 619.

No 2734 way 16th Oct/86

SEPTEMBER.

College of Engineering.

Forwarding to the Secretary of State report on the working of the — for the year 1885-86.

22/10

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With order