Coopers Hill

THE ROYAL

INDIAN ENGINEERING COLLEGE, COOPERS HILL.

CALENDAR

FOR

1894-95.

CONTAINING A SYLLABUS OF THE COURSES OF STUDY.

"MENTE MANUQUE."

Published by Authority.

LONDON:
W. H. ALLEN & CO., LIMITED, 13 WATERLOO PLACE,
PUBLISHERS TO THE INDIA OFFICE.
1894.

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W. H. HARLING

ship of the Calcutta Corporation.

The Cooper's Hill Dinner, which will be held at Bonsard's Hotel, Calcutta, on Dec. 23, says a local paper, promises to be a big and successful affair, as the names of fresh subscribers are daily being received. It is feared that Mr. Wynne, agent of the Bengal-Nagpore Railway, who is busy starting work on the Cuttack and Calcutta railway extensions, will be unable to be present, in which case the chair will probably be taken by Mr. Finney, manager of the Bengal State Railway, or Mr. F. B. Hebbert, Deputy Director-General. It is understood that Royal Engineers who have obtained their commission through Cooper's Hill, as well as the Political Department, are both likely to be represented.

Bengal Forest ...

Ma... ...nts

Est... ...post free. Telegrams: "Chinograph," London.

THE PERIYAR PROJECT.

THE Periyar works were opened on Oct. 11 by his Excellency the Governor, under most favourable conditions. The weather for some days previous had been stormy and unsettled, and the roads had been so bad that fears were entertained as to his Excellency's being able to arrive in time for the ceremony to be performed before dark. All doubts were set at rest by his Excellency's appearance within ten minutes of three o'clock, the programme time. He was met by Colonel Pennycuick and Mr. Pears, and conducted by them to the north end of the tunnel, where a numerous company, including the Commander-in-Chief in Madras, the Bishop of Tranvancore and between forty and fifty Europeans as well as a large number of native visitors, were assembled to meet him. Many of the native spectators had travelled long distances to attend the ceremony.

The proceeding opened with an address from the inhabitants of Kumili, after the presentation of which Mr. Pears read a brief account of the early history and subsequent progress of the works, and reported them ready to be brought into operation.

The bishop at his Excellency's request offered up a short prayer, on the conclusion of which a ribbon, displaying the combined colours of the Royal Engineers and Coopers Hill College, was cut by Mrs. Pennycuick and by an ingenious arrangement the sluices at the south end of the tunnel 6,000 feet away, were thus opened, and an interval of expectation occurred, during which Lord Wenlock made a short speech dwelling upon the advantages of irrigation and the interest felt therein by the Madras Government and that of India, and eulogising the services of Colonel Pennycuick, to whose energy the undertaking of the work was due, while its successful completion was singly due to his professional skill. He then announced that her Majesty had conferred the honour of a C.S.I. upon Colonel Pennycuick—an announcement that was received with hearty satisfaction.

After an interval of eleven minutes from the cutting of the ribbon, the water of the Periyar was seen pouring from the mouth of the tunnel, and Lord Wenlock called for three cheers for Colonel Pennycuick, which were heartily given. Numerous garlands were thrown into the river by the spectators, and after a short interval for refreshment the whole party proceeded to the Periyar Camp, from which most of the European visitors had come in the morning. The three steam launches, and the oil launch belonging to the project work were utilised for the purpose of transport. The scene at the Periyar Camp, a telegram states, was very beautiful, the natural beauty of the site being enhanced by the formation of the great lake, which is already some 6,000 acres in extent; while the illuminations in the neighbourhood added interest to the scene. A large party was assembled to meet His Excellency at dinner, after which Lord Wenlock proposed Colonel Pennycuick's health, in a cordial speech, in which he again dwelt upon the interest felt by his Government in irrigation, and exposed some ridiculous misstatements of the *Scientific American*. Colonel Pennycuick's reply was mainly a warm eulogy of the services of the executive staff, and he dwelt with deep feeling upon the cordial relations which existed between the Royal and Civil Engineers of the Madras Public Works Department. He concluded by proposing the health of Mr. Pears, and the executive staff.

Mr. Pears, in reply, endorsed the statements of Colonel Pennycuick in regard to the warm relations between himself and the executive staff, and the evening was altogether a most enjoyable one.

The whole arrangements were admirable, notwithstanding the difficulties of accommodation, transport, and supply in a place where the normal European population is less than twelve. The arrangements for the unexpectedly large party assembled were made without a single hitch.

The Commander-in-Chief left on Oct. 12 and Lord Wenlock on the 13th for a short sporting trip before returning to Madras.

The practical completion of the Periyar Project, at the inauguration

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1894.

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J. C. Dumbleton

Entered Oct 1st 1896 18 yrs + 10 months old.

CONTENTS.

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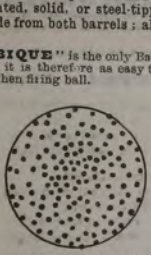

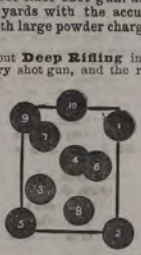

Lieut. H. M. BIDDULPH, Rifle Brigade, Srinagar, Kashmir, India, 10th June, 1893, writes:—

I must write to thank you for the magnificent gun you made for me. I mean the 12-bore "Ubique." I consider it a marvellous weapon, and fully equal to, if not a great deal better than, the various similar weapons in the market. What astonishes me is that you do not advertise it to shoot well up to 150 yards. I have made two bulls out of three shots with it at that distance, and on two or three occasions have killed running animals with it at 160 to 180 yards. In a year's shooting trip, during which I have enjoyed very good sport, I have killed more than half my total bag with it, and that in a country where the "Ubique" is rather at a disadvantage. I give you a complete analysis of its doings as it may interest you. The other weapons I had were a ·500 and a ·360-bore Express. My total bag was 48, and was divided among the three weapons thus:—

"UBIQUE":—16 Ibex, 6 Markhor, 2 Shapoo, 1 Yak, 1 Antelope, 1 Burkel, 1 Bear—28 head.
500-bore Express—6 Markhor, 6 Antelope, 2 Yak, 1 Orisammon—15 head.
360-bore Express—4 Antelope, 1 Ibex—5 head.

The wounds in every case of these that got away were in every case mere grazes, and did not reflect on the efficiency of the weapon.

The shooting at small game was most satisfactory—once I brought down two mallard with it at 45 yards—geese, duck, raw chikor, chikor, sand grouse, pigeons, snipe and hares were shot with it.

You are at liberty to make whatever use of this letter that you may think fit.

From O. J. MORRIS, Esq., Fort Victoria, Mashonaland, South Africa, May 28th, 1893.

Both the weapons ("Ubique" and ·577 "Magnum") are most satisfactory. J—— shot a fine lioness with the "Ubique" one early morning. It has demolished various big buck, and one of the biggest koodoo bulls I ever saw was killed by J—— with it, and with shot it has kept the camp well supplied with birds. Game is getting rather scarce about here, and some other waggons travelling with us depend entirely on us for meat.

Many other testimonials and full particulars in Catalogue, post free. Gentlemen are invited to see "UBIQUE" guns shot at our private range.

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* Sir D. Brandis is not on the Staff of the College.

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(Names placed alphabetically in each year.)

1873. Benton, J.
1874. Arundell, E. W., *B.A.*
„ Horn, D. B.
„ Parkes, B., *B.E.*
„ Wilson, W. J.
1876. Roberts, R. W.
„ *Sulivan, A.
„ Wolley-Dod, F.
1877. Boyce, H. G.
„ Reilly, F.
1878. Chadwick, W.
„ Prickett, L. G.
„ Woods, R. J., *B.E.*
1879. Hill, A.
„ Tuck, E. H.
„ Wyatt, J. W.
1880. Alexander, E. J.
„ Dyson, R. C.
1881. Deuchars, G.
„ Webb, A. L.
1882. Taylor, H. B.
„ Wylie, G.
1883. Bacon, H. M. J.
„ *Dyson, S. P. H.
1884. *Bower, P. F.
„ Roberts, C.
„ Sykes, C. F.
1885. Adam, J.
„ Grant, F.
1886. Cuming, J. H.
„ Gales, R. R.
1887. Currie, H. A. F.
„ Rogers, C. G.
„ Williams, W. R.
1888. Bell, E. A. S.
„ Clayton, F.
„ Dupuis, C. E.
„ Haines, H. H.
„ Osmaston, B. B.
1889. Coutts, E. G.
1890. Walsh, A. R.
1891. Care, S.
„ Heap, J. H.
„ Leete, F. A.
„ Richards, G.
„ Willmott, H. M.
1892. Laurie, A.C.
„ Lillie, G. E.
„ Lister, E. A.
1893. *Abbey, C. C.
„ Billson, H. G.
„ Coates, J.
„ Stapleton, B.
1894. Campbell, G. J.
„ Coventry, B. O.
„ Riddell, W. J.
„ Young, J. A. F.

* Deceased.

THE ROYAL INDIAN ENGINEERING COLLEGE, COOPERS HILL.

PROSPECTUS.

[The arrangements herein-after described are subject to revision under the orders of the Secretary of State.]

THE Royal Indian Engineering College is primarily maintained under the orders of the Secretary of State for India in Council, in view to the education of candidates for the service of Government in the Indian Public Works, Telegraph and Forest Departments; but it is open, to the extent of the accommodation available, to all persons desirous of following the course of study pursued in it.

2. Candidates for the Indian Forest Department are selected under special arrangements (paras. 37 and 38).

3. Nominations to the Indian Telegraph Department are made from among the Engineer students at the College at the end of their first year of study (paras. 34, 35, 36).

4. About fifty Engineer students are admitted yearly to the College. Candidates for admission must be between the ages of 17 and 21 years on the 1st day of July of the year of admission, and of good moral character; they must have received a good general education, and have attained to a sufficient degree of proficiency in elementary mathematics to enable them to follow the College course with advantage. These limits of age do not apply to students who are not candidates for Government appointments.

5. In the event of there being more qualified candidates for admission than the College can receive, the preference will be given according to dates of application for admission.

6. The collegiate year usually begins in the latter part of September. Applications for admission as Engineer Students may be made at any time, but not later than the 15th day of

June of the year named for admission, except with the special permission of the President.

7. In every case application for admission must be made on the prescribed forms, which can be obtained from the Secretary to the College.

8. Candidates whose applications are found satisfactory as to age and character will be required to undergo an examination, to be held at the College, about the last week in June of the year for admission.

9. A fee of £2 will be payable in advance by each candidate accepted for examination. It will be called for early in May.

10. The examination will be in the undermentioned subjects :—

(*a.*) English Composition, to the extent of being able to write grammatically, and with correct spelling, in a neat and legible hand.

(*b.*) Mathematics as under, viz. :—

Arithmetic.

Elementary Algebra, including Quadratic Equations, Arithmetical and Geometrical series, Ratio, Proportion and Variation, Surds and Indices, and the Binomial Theorem.

Geometry. The first four and sixth books of Euclid, with easy riders.

*Mensuration.

Elementary Plane Trigonometry,† including Identities; formulæ relating to the sum and difference, and the multiplication and division of Angles; Equations; properties and solution of Triangles, and use of Logarithms.‡

11. Candidates will also be required to give evidence of having received a fair general education, by undergoing an examination in some classical or modern language, and in history or geography.

* Todhunter's treatise, or any similar work, will be sufficient.

† To the extent, for example, of Todhunter's *Trigonometry for Beginners*. Importance will be attached to arithmetical accuracy both in Mensuration and in Trigonometry.

‡ Bremiker's *Logarithms* (with Appendix), D. Nutt, is the book used in the College.

12. The President may dispense with the whole or any portion of this examination in the case of a candidate who produces a University Diploma, or other similar certificate granted by a recognised examining body. In all such cases, however, the entrance fee of £2 will be payable.

13. The College course, both in Engineering and Forestry, extends over three years, and that in Telegraphy (para. 35) over two years. The appointments to the Indian services offered by the Secretary of State for India are awarded on the completion of each course to duly qualified successful candidates, subject to the conditions as to physical fitness described in para. 25.

14. Each annual session begins in September, and is divided into three terms, with vacations of about four weeks at Christmas, two weeks at Easter, and eight weeks in the Summer.

15. An annual charge of £183 is made for each student, which must be paid in advance to the Bank of England in three sums of £61 per term. Receivable orders with full directions as to the mode of payment will be forwarded from the India Office to the Parents or Guardians shortly before the fees fall due. A Student will not be allowed into residence until his fee has been paid.

16. A deposit of £5 is required from each student on admission to the College, as caution money, to cover charges incurred by him for damage to books, instruments, &c., or any College bills outstanding on leaving the College. When these have been defrayed the balance standing at his credit will be repaid. This deposit is to be paid with the fee for the first term, making the total payment on that occasion £66.

17. The College fees include all charges for tuition, board according to the College tariff, and lodging, with washing to the amount of 2*s*. weekly, and for ordinary medical attendance. Students are required to provide their own class books and drawing instruments. Drawing paper, drawing boards, and surveying instruments are provided by the College.

18. The subjects of study at the College are:—

Descriptive Engineering.
Surveying.

Architecture.
Geometrical Drawing.
Estimating and Accounts.
Exercises in Design.
Workshop Practice.
Mechanical Laboratory.
Applied Mechanics.
Pure and Applied Mathematics.
*Chemistry (Theoretical and Practical).
*Physics (Mathematical and Practical).
Geology and Mineralogy.
*French.
*German.
*Free-hand Drawing.
Chemistry of Soils and Vegetation, Botany, Entomology, Forestry } For Forest Students only.
Telegraph Construction, Telegraph Signalling } for Telegraph Students only.

19. The proficiency of the students in the studies pursued is tested by periodical examinations, and by assigning values to the drawings, surveys, notes, &c. executed by them while at the College.

20. The subjects enumerated in para. 18 are grouped in certain main branches of study, and a fixed minimum of qualification is required in each branch, as well as a certain minimum of average proficiency in all the branches taken together, as tested by the aggregate marks gained, in order to obtain the ordinary College diploma (*see* para. 22). But Engineer Students are encouraged to pursue more particularly those branches of study beyond the limits of the obligatory course for which they may show special aptitude. Superior attainments will be recognised by special diplomas (*see* para. 22).

21. A final examination will be held during the last year of the course, with the assistance of special examiners not connected with the College. This final examination, in addition to paper work and *viva voce* questioning, will embrace exercises in surveying,

* These subjects are, some wholly, some partially, alternative.

drawing, designing, and estimating, which will occupy some weeks in execution.

22. Engineer students, not exceeding three in number, and Forest students not exceeding two, in any year, who pass out of the College with special distinction, may be appointed "Honorary Fellows of Coopers Hill." The Diploma of "Associate" will be bestowed on all others who pass out in the First Class in one at least of the branches mentioned in para. 20. All others who come up to the prescribed standard of qualification will receive the ordinary diploma of the College.

23. Every student will be required to conform to the College rules, to exhibit due diligence in his studies throughout the course, and to give evidence of satisfactory progress at the different examinations, failing which, or in the event of serious personal misconduct, he will not be allowed to remain at the College.

INDIAN PUBLIC WORKS APPOINTMENTS.

24. The Secretary of State for India offers annually a number of appointments in the Indian Public Works Department for competition among the students of the College. If possible, the precise number will be notified four years beforehand, that is, about a year before the students concerned enter the College.*

25. Those students who have reached the prescribed standard of qualification, being British subjects, of sound constitution, and free from any serious physical defects † which would render them unfit for employment in the Public Works Department of India (the final decision on which point will rest with the Secretary of

* The number of appointments in the Indian Public Works Department offered by the Secretary of State for India to the students who enter the College in 1894 is twelve.

† On the subject of the standard of eyesight required for the Indian Public Works and Telegraph Departments, a pamphlet has been published under the authority of the Secretary of State in Council by Messrs. Churchill and Sons, 11, New Burlington Street, to which attention is specially drawn, since it is important that candidates shall place themselves in full possession of information regarding the tests that will be applied.

INDIAN FOREST APPOINTMENTS.

37. The candidates selected by the Secretary of State for India for the Indian Forest Department are received into the College for three years' instruction, and are required to conform to its rules.

38. The method of selection is different from that adopted in the case of the Public Works and Telegraph Department candidates. It is explained in the Indian Forest Service Regulations, which can be obtained on application to the Revenue Department of the India Office.*

GENERAL RULES.

39. The College authorities, on application from students, will endeavour to arrange for placing those who pass out of the College with a Diploma in Engineering, but do not enter the Indian service, as pupils for one or two years with Civil or Mechanical Engineers of standing, at moderate rates of premium, payable by the students.

40. Chemical, physical, botanical, and mechanical laboratories, a library, gymnasium, and workshops (electrically lighted) provided with steam and gas power and machinery are attached to the College. Means are also provided for the practice of photography. Students making use of the laboratories are supplied with the needful apparatus. They are required to provide their own hand-tools in the workshop.

41. The responsibility for the discipline and management of the College, and for the superintendence of the studies, is vested in the President, under the general control of the Secretary of State for India.

42. The students are distributed in divisions, under personal charge of one of the Professors or Instructors selected as tutor by the President, to whom the tutor is responsible for exercising the proper degree of personal supervision over each student in his

* Reprinted here, page 119.

division, and for conducting necessary correspondence with the student's parents or guardians.

43. Each student is provided with a separate room, and with fuel and light, also with the necessary attendance. Furniture and bedding are supplied by the College, but each student is required to provide his own towels and bed linen. Meals are taken in Hall. Wine and beer are not included in the ordinary fare, but can be obtained from the College cellar at fixed prices.

44. A chapel is attached to the College, which the students are expected to attend, unless specially exempted at the wish of their guardians.

45. Every student will be required to go through a course of gymnastics, and also of Military exercises, including the use of the Rifle.

46. Students are required to wear academical dress, under such regulations as may be prescribed from time to time.

47. Every student selected for any of the Indian Services is required, before proceeding to India, to furnish to the President satisfactory evidence of his competency in riding.

Rules for daily routine. hours of meals
Regulations for dress, for visitors, guests, absence, study
Games, clubs, visiting out. lectures & private study
I should begin here. Fines and extra charges for tuition
for not paying accounts up to date should be
mentioned

Joseph's weight on entrance 30th Sept 96
last 96 lbs or say 7 stone 2

PARTICULARS REGARDING THE INDIAN PUBLIC WORKS DEPARTMENT.

[The arrangements herein-after described are subject to revision according to the requirements of the service.]

1. The Engineer Establishment of the Indian Public Works Department consists of the staff of Engineers, military and civil, engaged on the construction and maintenance of the various public works undertaken by the State in India.

2. The Department is recruited from the following sources:—

(1.) Officers of Royal Engineers.

(2.) Officers of the Indian Army who have passed the qualifying examination.

(3.) Students of Government Civil Engineering Colleges in England and India.

(4.) Occasional admission of other qualified persons.

3. The head of the whole Department is the Public Works Secretary to the Government of India. There are also three Deputy Secretaries, each in charge of one of the three branches into which the business of the department is divided; *viz.*, Civil Works, Railways, and Accounts.

4. The various ranks of the Department are as follows:—

	Salary per annum.
Chief Engineers, First Class	Rs. 30,000
,, ,, Second Class	24,000
,, ,, Third Class	21,600
Superintending Engineer, First Class	19,200
,, ,, Second Class	16,200
,, ,, Third Class	13,200

	Salary per annum.
Executive Engineers, First Grade	Rs. 12,000
,, ,, Second Grade	10,200
,, ,, Third Grade	8,400
Assistant Engineers, First Grade	6,600
,, ,, Second Grade	5,400
,, ,, Third Grade	4,200
Apprentices	1,200

5. Passed students from Coopers Hill College who have competed successfully for appointments in the Indian Public Works Department will, in the absence of any special reasons to the contrary, be appointed to the rank of Assistant Engineers, Third Grade.

6. Promotions from one grade or class to another are dependent on the occurrence of vacancies in the sanctioned establishment, and are regulated in the following way:—

7. Promotions throughout all grades in Madras and Bombay are made by the Governments of these provinces respectively; also in Bengal, the North-West Provinces, and the Punjab, except as regards the appointments of Chief Engineer, which are made by the Government of India.

8. In the other provinces,* the promotions of Assistant and Executive Engineers are made by the Local Administrations, but the promotions and appointments of Superintending and Chief Engineers are made by the Government of India, on one general list for all these provinces.

9. Promotions in the Railway Branch of the Department are made by the Government of India.

10. Promotion is made wholly by selection; mere seniority is considered to confer no claim to it.

* Oudh, Central Provinces, Burmah, Berar (Hyderabad), Mysore, Rajpootana, Central India, Assam.

PENSIONS AND PROVIDENT FUND.

11. With the sanction of the Secretary of State, the following improved scale of Ordinary Pensions for the European Civil Engineers of the Superior Engineering Branch of the Public Works Department, and those who may be transferred from that branch to any other branch of the Department, has been adopted :—

On Medical Certificate.

No. of Years' Service.	Sixtieth Parts of Average Emoluments.*	Subject to a Maximum of Rupees per annum.
10	20	1,000
11	21	1,400
12	22	1,800
13	23	2,200
14	24	2,600
15	25	
16	26	
17	27	3,000
18	28	
19	29	

Without Medical Certificate.

20 to 24	30		4,000
25 and upwards			5,000

12. The following special additional pensions are also authorised as rewards of approved service for those Officers who serve in the high and responsible positions of Chief and Superintending Engineers :—

Extra Pension over and above that allowable according to the above Scale.

To those who have served 3 years as Chief Engineers, or who have been graded as such—Rs. 2,000 per annum.

To those who have served 3 years as Superintending Engineers—Rs. 1,000 per annum.

* "Average emoluments" means the average calculated on the last five years of service.

13. The above rules apply to Engineers, among others, appointed by the Secretary of State who have been trained at Coopers Hill.

14. The institution of a Provident Fund for all Civil Engineers of the Department on the following basis is sanctioned:—

(1.) The contribution to be compulsory up to 5 per cent. on salaries, with voluntary contributions of a further 5 per cent.

(2.) Compound interest at 4 per cent. on such payments to be annually credited by Government to each officer subscribing.

(3.) The sum which will thus accumulate to the credit of an officer to be his absolute property to be handed over to him, unconditionally, on quitting the service; or, in the event of his death before retirement, to his legal representatives.

15. The rules regarding pension, embodied in paragraphs 11 to 13, will apply with retrospective effect from the 1st May 1883 to all classes of Civil Engineers to whom they are applicable.

PARTICULARS REGARDING THE INDIAN T
DEPARTMENT.

[The arrangements and salaries herein-after describe
to revision according to the requirements of the

1. The Superior Establishment of the Indian T
partment is engaged on the construction and super
various telegraph lines belonging to the Government

2. The Department is chiefly recruited by stu
Royal Indian Engineering College at Coopers Hill.

3. The various ranks of the Superior Establis
follows:—

	Initial Salary per mensem.	Increase per mensem per annum.	Maximum Salary per mensem.	
	Rs.	Rs.	Rs.	
1 Director General . . .	—	—	3,000	
1 Deputy Director General .	—	—	2,000	
2 Directors with pay as Superintendents, 1st Grade + Rs. 100 per mensem.				
4 Superintendents, 1st Grade .	1,125	75	1,500	
10 „ 2nd „ .	—	—	1,000	
12 „ 3rd „ .	—	—	850	
13 Assistant Superintendents (Class V.), 1st Grade .	—	—	700	Rs. 100 ance appr
15 ditto (Class V.), 2nd Grade .	—	—	550	Rs. 10 year
15 ditto (Class VI.) 1st Grade .	—	—	400	Rs. 10 year
9 ditto (Class VI.), 2nd Grade .	—	—	300	Rs. 5 year

4. Passed students from Coopers Hill College who have competed successfully for appointments in the Indian Telegraph Department will, in the absence of any special reasons to the contrary, be appointed to the rank of Assistant Superintendents, Class VI., 2nd Grade.

5. Promotions from one grade or class to another are dependent on the occurrence of vacancies in the sanctioned establishment.

6. Promotion is made by selection with due regard to seniority, which, by itself, is not considered to confer a claim to it.

7. It is to be clearly understood that the Government reserves to itself the right of appointing any person not in the regular telegraph service to any post in the Department for which they may consider him specially qualified, and also of generally regulating promotions and retirements in the Department as appears to them most conducive to the interests of the public service.

THE PENSION RULES embodied in arts. 11 to 13, p. 20, are at present applicable to Officers appointed to the Telegraph Department from the Royal Indian Engineering College.

ALMANAC.

The arrangements indicated in this Almanac are liable to be modi
time; and the dates assigned to the various Examinations
regarded as only approximate.

Day of		September 1894.
Month.	Week.	VACATION. AUTUMN T
1	S	
2	Sun	15*th after Trinity*
3	M	
4	Tu	
5	W	
6	Th	
7	F	
8	S	
9	Sun	16*th after Trinity*
10	M	
11	Tu	
12	W	
13	Th	
14	F	
15	S	
16	Sun	17*th after Trinity*
17	M	
18	Tu	
19	W	
20	Th	
21	F	
22	S	
23	Sun	18*th after Trinity*
24	M	
25	Tu	**Twenty-fourth College Session b**
26	W	3rd Year Project Survey begins
27	Th	
28	F	
29	S	
30	Sun	19*th after Trinity*

Day of		October 1894.
Month.	Week.	AUTUMN TERM.
1	M	2nd Week
2	Tu	
3	W	
4	Th	
5	F	
6	S	
7	Sun	*20th after Trinity*
8	M	3rd Week
9	Tu	
10	W	
11	Th	
12	F	
13	S	
14	Sun	*21st after Trinity*
15	M	4th Week
16	Tu	
17	W	
18	Th	
19	F	Project Field-work ends
20	S	
21	Sun	*22nd after Trinity*
22	M	5th Week. Regular lectures begin for 3rd Year
23	Tu	
24	W	Oxford Football Match (Recess Day)
25	Th	Course of Accounts begins
26	F	
27	S	
28	Sun	*23rd after Trinity*
29	M	6th Week. Volunteer Year ends. 2nd Yr. Exam.
30	Tu	[App. Mech. (Construction). Date approx.
31	W	

Day of		November 1894.
Month.	Week.	AUTUMN TERI
1	Th	
2	F	
3	S	
4	Sun	*24th after Trinity*
5	M	7th Week
6	Tu	
7	W	
8	Th	
9	F	3rd Year Project Survey Drawing
10	S	
11	Sun	*25th after Trinity*
12	M	8th Week. Mechanical Engin
13	Tu	
14	W	
15	Th	
16	F	
17	S	
18	Sun	*26th after Trinity*
19	M	9th Week
20	Tu	
21	W	
22	Th	
23	F	
24	S	
25	Sun	*27th after Trinity*
26	M	10th Week
27	Tu	
28	W	
29	Th	
30	F	

Day of		December 1894.
Month.	Week.	AUTUMN TERM. VACATION.
1	S	
2	Sun	*1st in Advent*
3	M	11th Week
4	Tu	
5	W	
6	Th	
7	F	
8	S	
9	Sun	*2nd in Advent*
10	M	12th Week
11	Tu	
12	W	Autumn Term Examinations begin. Date approx.
13	Th	[For subjects, see page 37
14	F	
15	S	
16	Sun	*3rd in Advent*
17	M	13th Week
18	Tu	
19	W	**Autumn Term ends**
20	Th	
21	F	
22	S	
23	Sun	*4th in Advent*
24	M	
25	Tu	*Christmas Day*
26	W	
27	Th	
28	F	
29	S	
30	Sun	*1st after Christmas*
31	M	

Day of		January 1895.
Month.	Week.	VACATION. EASTER T
1	Tu	
2	W	
3	Th	
4	F	
5	S	
6	Sun	*Epiphany*
7	M	
8	Tu	
9	W	
10	Th	
11	F	
12	S	
13	Sun	1*st after Epiphany*
14	M	
15	Tu	
16	W	
17	Th	Easter Term begins
18	F	Autumn Term Exams. end
19	S	
20	Sun	2*nd after Epiphany*
21	M	2nd Week
22	Tu	
23	W	
24	Th	
25	F	
26	S	
27	Sun	3*rd after Epiphany*
28	M	3rd Week
29	Tu	
30	W	
31	Th	Mechanical Engineering Design

Day of		February 1895.
Month.	Week.	EASTER TERM.
1	F	Architectural Design begins
2	S	[(for which Chem. Lab. or Phy. Lab. may be substituted)
3	**Sun**	*4th after Epiphany*
4	M	4th Week
5	Tu	3rd Year Exam. App. Mechanics (Hydraulics
6	W	[and Machinery). Date approx.
7	Th	Exam. Accounts for 3rd Year Engineer and
8	F	[Forest and for Telegraph Students.
9	S	[Date approx.
10	**Sun**	*Septuagesima Sunday*
11	M	5th Week
12	Tu	
13	W	
14	Th	
15	F	
16	S	
17	**Sun**	*Sexagesima Sunday*
18	M	6th Week
19	Tu	
20	W	
21	Th	2nd Year Exam. App. Mechanics (Construction).
22	F	[Date approx.
23	S	
24	**Sun**	*Quinquagesima Sunday*
25	M	7th Week
26	Tu	
27	W	*Ash Wednesday*
28	Th	Mid-Session Change of Studies

Day of		March 1895.
Month.	Week.	EASTER TERM
1	F	
2	S	
3	**Sun**	*1st in Lent*
4	M	8th Week
5	Tu	
6	W	
7	Th	
8	F	
9	S	
10	**Sun**	*2nd in Lent*
11	M	9th Week
12	Tu	
13	W	
14	Th	
15	F	
16	S	
17	**Sun**	*3rd in Lent*
18	M	10th Week
19	Tu	
20	W	
21	Th	Architectural Design handed in (noo
22	F	[Opt.
23	S	
24	**Sun**	*4th in Lent*
25	M	11th Week.
26	Tu	Term Exams. begin. Date approx.
27	W	[jec
28	Th	
29	F	
30	S	
31	**Sun**	*5th in Lent*

Day of		April 1895.
Month.	Week.	EASTER TERM. VACATION.
1	M	12th Week
2	Tu	
3	W	
4	Th	
5	F	**Easter Term ends**
6	S	
7	Sun	*Palm Sunday*
8	M	
9	Tu	came home 1897
10	W	
11	Th	
12	F	*Good Friday*
13	S	
14	Sun	*Easter Sunday*
15	M	
16	Tu	
17	W	
18	Th	
19	F	
20	S	
21	Sun	*1st after Easter*
22	M	
23	Tu	**Summer Term begins**
24	W	Engineering Design begins
25	Th	
26	F	Tuesday returned in 1897
27	S	
28	Sun	*2nd after Easter*
29	M	2nd Week
30	Tu	

Day of Month.	Day of Week.	May 1895. SUMMER TERM.
1	W	
2	Th	
3	F	
4	S	
5	Sun	*3rd after Easter*
6	M	3rd Week
7	Tu	
8	W	
9	Th	
10	F	
11	S	
12	Sun	*4th after Easter*
13	M	4th Week.
14	Tu	
15	W	
16	Th	
17	F	
18	S	
19	Sun	*Rogation Sunday*
20	M	5th Week
21	Tu	3rd Year Exam., Descrip. Eng., Construction.
22	W	[Date approx.
23	Th	*Ascension Day.* 2nd Year Exam. Descrip. Engi-
24	F	*Queen's Birthday* [neering, Constrn. Date app.
25	S	
26	Sun	*Sunday after Ascension*
27	M	6th Week. 3rd Year Exam. Estimating.
28	Tu	[Date approx.
29	W	
30	Th	
31	F	

Day of		June 1895.
Month.	Week.	SUMMER TERM.
1	S	
2	Sun	*Whit Sunday*
3	M	7th Week. Gymnastic Competition
4	Tu	
5	W	
6	Th	
7	F	
8	S	
9	Sun	*Trinity Sunday*
10	M	8th Week
11	Tu	Note books of Engineering Design handed in (noon)
12	W	
13	Th	
14	F	
15	S	
16	Sun	*1st after Trinity*
17	M	9th Week.
18	Tu	
19	W	
20	Th	*Queen's Accession.* Engineering Design handed in (noon)
21	F	
22	S	
23	Sun	*2nd after Trinity*
24	M	10th Week. Practical Chemistry begins. Date approx. 1st and 2nd Years Exam. in
25	Tu	
26	W	
27	Th	
28	F	[Date approx. For subjects, see p. 38
29	S	3rd Year Final Exams. begin for Engineers.
30	Sun	*3rd after Trinity*

Day of Month.	Day of Week.	July 1895. SUMMER TERM. VACATION.
1	M	11th Week.
2	Tu	
3	W	
4	Th	
5	F	
6	S	
7	Sun	*4th after Trinity*
8	M	12th Week. Annual Exams. begin generally.
9	Tu	[(Date approx.). For subjects, see p. 38
10	W	
11	Th	
12	F	
13	S	
14	Sun	*5th after Trinity*
15	M	13th Week
16	Tu	
17	W	
18	Th	
19	F	
20	S	
21	Sun	*6th after Trinity*
22	M	
23	T	
24	W	
25	Th	Annual Exams. end. Recess begins
26	F	
27	S	
28	Sun	*7th after Trinity*
29	M	
30	Tu	
31	W	Distribution of prizes, &c. Summer Term and [Twenty-fourth Session end

Day of		August 1895.
Month.	Week.	VACATION.
1	Th	
2	F	
3	S	
4	**Sun**	*8th after Trinity*
5	M	
6	Tu	
7	W	
8	Th	
9	F	
10	S	
11	**Sun**	*9th after Trinity*
12	M	
13	Tu	
14	W	
15	Th	
16	F	
17	S	
18	**Sun**	*10th after Trinity*
19	M	
20	Tu	
21	W	
22	Th	
23	F	
24	S	
25	**Sun**	*11th after Trinity*
26	M	
27	Tu	
28	W	
29	Th	
30	F	
31	S	

Day of		September 1895.
Month.	Week.	VACATION. AUTUMN T
1	Sun	12*th after Trinity*
2	M	
3	Tu	
4	W	
5	Th	
6	F	
7	S	
8	Sun	13*th after Trinity*
9	M	
10	Tu	
11	W	
12	Th	
13	F	
14	S	
15	Sun	14*th after Trinity*
16	M	
17	Tu	
18	W	
19	Th	
20	F	
21	S	
22	Sun	15*th after Trinity*
23	M	
24	Tu	
25	W	
26	Th	
27	F	
28	S	
29	Sun	16*th after Trinity*
30	M	2nd Week
October 1st.	T	Twenty-fifth College Session [A

SUBJECTS OF EXAMINATION AT THE END OF EACH TERM.*

These arrangements are liable to be modified from time to time.

ENGINEER STUDENTS.

Autumn Term.

Third Year.—Applied Mechanics (Construction): Optional Applied Mechanics (Hydraulics and Machinery).

Second Year.—Applied Mechanics (Construction); Applied Mechanics (Mechanism); Integral Calculus; Kinetics; Optional Mathematics; Surveying; Geology; Physics; Descriptive Engineering.

First Year.—Trigonometry and Plane Analytical Geometry; Statics; Optional Mathematics; Practical Geometry; Drawing Exercise; Geology; Chemistry; Descriptive Engineering.

Easter Term.

Third Year.—Applied Mechanics (Construction); Optional Applied Mechanics (Construction); Applied Mechanics (Heat and Combustion); Accounts.

Second Year.—Applied Mechanics (Construction); Applied Mechanics (Machines); Dynamics; Pure Mathematics; Optional

* Various intermediate examinations occur in addition, for which see the Almanac.

Mathematics; Geology; Descriptive Engineering; Surveying; Physics.

First Year.—Plane Analytical Geometry; Differential Calculus; Application of Logarithms; Hydrostatics; Optional Mathematics; Geology; Drawing Exercise; Descriptive Engineering; Chemistry.

Summer Term.

(*Annual Examination.*)

Third Year, Final Examination.—Applied Mechanics (Construction); Optional Applied Mechanics (Construction); Applied Mechanics (Machinery and Hydraulics, two papers); Optional Applied Mechanics (Machinery and Hydraulics), two papers; Descriptive Engineering (Construction); Descriptive Mechanical and Hydraulic Engineering.

Second Year.—Applied Mechanics (Construction); Applied Mechanics (Hydraulics and Machines); Mensuration, Trigonometry and Plane Analytical Geometry; Statics and Hydrostatics; Dynamics; Differential and Integral Calculus; Optional Mathematics; Descriptive Engineering (Construction); Descriptive Hydraulic Engineering; Architecture; Drawing Exercise; Chemical and Physical Laboratories; French or German.

First Year.—Differential and Integral Calculus; Statics and Hydrostatics; Trigonometry and Conics; Kinematics and Kinetics; Optional Mathematics; Architecture; Descriptive Engineering (Construction); Surveying; Descriptive Geometry; Chemistry; Physics; Drawing Exercise; French or German.

TELEGRAPH STUDENTS.

Autumn Term.

Applied Mechanics (Construction); Integral Calculus; Kinetics; Electricity and Magnetism; Physical Laboratory and Paper; Workshop Practice; Signalling; Descriptive Telegraph Engineering.

Easter Term.

Accounts; Applied Mechanics (Construction); Pure Mathematics; Dynamics; Electricity and Magnetism; Physical Laboratory and Paper; Workshop Practice; Signalling; Descriptive Telegraph Engineering.

Summer Term.

(*Final Examination.*)]

Applied Mechanics (Construction); Applied Mathematics; Electricity and Magnetism; Physical Laboratory and Paper; Workshop Practice; Signalling.

TABLE OF MARKS ALLOTTED TO THE VARIOUS SUBJECTS OF THE COURSE OF STUDY FOR ENGINEER STUDENTS AT COOPERS HILL.

N.B.—The arrangements notified in this table are liable to alteration from time to time.

Categories.	Subjects.	Obligatory Subjects.		Optional Subjects. Maximum Obtainable.	Professors or Lecturers in Charge.
		Qualifying Minimum.	Maximum Obtainable.		
Branch I. Engineering.	Descriptive Engineering	—	520 (1) (2) (3)	—	Reilly, Hearson, Heath
	Surveying	—	360 (1) (2)	—	Courtney, Woods
	Elements of Architecture	—	100 (1) (2)	—	Hicks
	Geometrical Drawing	—	380 (1) (2)	—	Hicks
	Estimating	—	80 (3)	—	Hicks
	Accounts	—	70 (3)	—	Hurst
	Project (Survey and Estimate)	—	140 (3)	—	Heath
	Engineering Design	—	100 (3)	80 (3)	Reilly
	Mechanical Design	—	100 (3)	80 (3)	Hearson
	Workshop	—	30 (1)	160 (1) (2)	Reilly
	Reports	—	—	80 (2)	Heath
	Mechanical Laboratory	—	60 (3)	—	Hearson
	Architectural Design (see below under Alternative Subjects)	—	— (3)	—	Hicks

Branch III. Mathematics.	Pure Mathematics	—	400 (1) (2)	150 (1) (2)	Lodge
	Applied Mathematics	—	400 (1) (2)	150 (1) (2)	Minchin
	Total	$\frac{1}{4} \times 800 = 200$	800	300	
Branch IV. Natural Science.	Chemistry	—	160 (1)	—	McLeod
	Physics	—	160 (1) (2)	—	Stocker
	Geology and Mineralogy	—	210 (1) (2)	—	Seeley
	Geological Excursions and practice	—	30 (1)	—	Seeley
	Chemical Laboratory	—	100 (1)	80 (2)	McLeod
	Physical Laboratory	—	100 (2)	—	Stocker
	Chemical Laboratory } (Advanced work (see below	—	— (3)	—	McLeod
	Physical Laboratory } (under Alternative Subs.)	—	— (3)	—	Stocker
	Total, without Advanced Laboratory	$\frac{1}{3} \times 760 = 253$	760	80	
	Total with ditto.	$\frac{1}{3} \times 860 = 287$	860	160	
Alternative Subjects.	Architectural Design (Branch I.), or				Hicks
	Advanced work in Chemical Laboratory, or (One only	—	(3) 100	(3) 80	Heath / McLeod
	Advanced work in Physical Laboratory, (Branch IV.)				Stocker
	Freehand Drawing, or (One only	—	(1) 80	(2) 80	Dowson
	French, or				Perret
	German				Dittel
Drill		— 30			
Gymnastics		— 70	100		
	Grand Total in Obligatory Studies		4580	Highest attainable, 1000.	
	Ditto Optional Ditto				

Qualifying minimum in the total, $0{\cdot}4 \times 4580 = \underline{1832}$, and also $0{\cdot}4 \times$ aggregate of marks awarded for obligatory work of the third year, marks earned in optional subjects being counted in these minima. (1) First Year. (2) Second Year. (3) Third Year.

In the second year marks can be obtained in only one optional subject, exclusive of "Reports."

Optional marks in less than the following proportion of the maximum obtainable will not be counted: Branches I., IV., and the Alternative Subjects, 30 per cent.; Branches II. and III., 20 per cent.

For further explanations, see next page.

CONDITIONS OF QUALIFICATIONS FOR EN DIPLOMAS.

The foregoing Table shews the distributio the different branches of study, which are all the term examinations, partly to the annual and also the minimum marks (to be earned work only) required for qualification in each branches.

In order to earn the lower diploma, or c the candidate has satisfied the examiners, i not only to obtain the qualifying minim assigned to the obligatory parts of each separately, but also not less than 1832 ma subjects taken together; and, again, two-fift awarded for obligatory work in the thir marks gained in the optional subjects, dur course and the third year, respectively, will these aggregate totals.

At the final examinations, held in the sec year, the results will be recorded separatel the four branches into which the Cours viz.:—Engineering, Applied Mechanics, Ma Natural Science; and Lists, divided into will be published of those Students, place merit, who qualify in each branch. To q higher diploma of Associate it is necessar First Class in one of those four branches. exceeding three in any one year), who attai tinction, may be appointed Honorary Fellow Hill by the Secretary of State for India o mendation of the President and Board of will receive the Diploma of Fellowship.

The final examination will be conducted pa of written papers and, if thought expedien *voce;* it will also include exercises in surve estimating, and designing, which will occupy in execution. In assigning their marks, t will take into consideration the drawing field-books, and other work performed by St their course of preparation, to which n allotted.

OBLIGATORY COURSE OF INSTRUCTION FOR ENGINEER STUDENTS.

The following Table gives the subjects taught in each year of the College course, and approximately the average number of hours allotted weekly to *obligatory* lecture instruction on each subject; all being liable to alteration from time to time, and a varying amount of time being prescribed in addition for private study:—

First Year.	Approximate Average Hours

It is possible that, during the Session of 1894—95, and subsequent Sessions, the optional subjects and marks in Branch II. may be amalgamated with the obligatory subjects and marks.

Second Year.	Approximate Average Hours per Week in Lecture
Engineering and Applied Mechanics	9
Geometrical and Engineering Drawing	4
Freehand Drawing	$1\frac{3}{4}$
Surveying (for $1\frac{1}{2}$ terms)	9
Physics (during 2 terms)	1
Physical Laboratory	$2\frac{3}{4}$
Mathematics (1st year's course continued)	7
Geology (during 2 terms)	2
Elements of Architecture (during 1 term)	2
French or German*	$1\frac{3}{4}$

The Chemical Laboratory, or the Workshop, or the Freehand Drawing Class are open to each Student for optional study and practice during one or more afternoons per week.

* Alternative with Freehand Drawing.

CONDITIONS OF QUALIFICATIONS FOR EN
DIPLOMAS.

The foregoing Table shews the distributio
the different branches of study, which are all
the term examinations, partly to the annual
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allotted.

OBLIGATORY COURSE OF INSTRUCTION FOR ENGINEER STUDENTS.

The following Table gives the subjects taught in each year of the College course, and approximately the average number of hours allotted weekly to *obligatory* lecture instruction on each subject; all being liable to alteration from time to time, and a varying amount of time being prescribed in addition for private study:—

First Year.	Approximate Average Hours per Week in Lecture.
Descriptive Engineering	$1\frac{1}{2}$
Geometrical and Engineering Drawing	7
Surveying (partly in the field during $1\frac{1}{2}$ terms)	$7\frac{1}{2}$
Freehand Drawing	$1\frac{3}{4}$
Chemistry	2
Chemical Laboratory	$2\frac{3}{4}$
Physics	1
Mathematics (Trigonometry, Plane Analytical Geometry, Elements of the Calculus, Statics, Kinematics, and the Elements of Kinetics)	11
Geology (during 2 terms)	2
Elements of Architecture (during 1 term)	2
French or German*	$1\frac{3}{4}$
Workshop (every alternate week)	2

The Workshop is open for further (optional) practice to each Student for one or more afternoons per week.

Second Year.	Approximate Average Hours per Week in Lecture
Engineering and Applied Mechanics	9
Geometrical and Engineering Drawing	4
Freehand Drawing	$1\frac{3}{4}$
Surveying (for $1\frac{1}{2}$ terms)	9
Physics (during 2 terms)	1
Physical Laboratory	$2\frac{3}{4}$
Mathematics (1st year's course continued)	7
Geology (during 2 terms)	2
Elements of Architecture (during 1 term)	2
French or German*	$1\frac{3}{4}$

The Chemical Laboratory, or the Workshop, or the Freehand Drawing Class are open to each Student for optional study and practice during one or more afternoons per week.

* Alternative with Freehand Drawing.

THIRD YEAR.

Engineering and Applied Mechanics .
Accounts (during 2 terms) . . .
Estimating (during 2 terms) . . .
Mechanical Laboratory (total 32 hours).

During this year, in addition to the class
Students are employed in making a complete de
the Field with plans, estimate of quantities, &c.,
two or three miles of Railway, Road, or Canal.
about seven weeks. The Students are then empl
out three complete and detailed designs to cond
supplied to them. The subjects of these designs
Civil Engineering, Mechanical Engineering, an
Each design occupies about seven weeks. T
Physical Laboratory may be chosen instead of t
design. In the Mechanical Laboratory the Studen
in testing the mechanical properties and value
Cement, Lubricating Materials, &c.

Instruction in Photography is given during th
one term to a limited number of Students.

COURSE OF INSTRUCTION FOR TE
STUDENTS.

FIRST YEAR.

Telegraph Students are nominated from amon
Students at the end of the first year.

SECOND YEAR.

Applied Mechanics (Construction) .
Chemical Laboratory . . . .
Pure Mathematics (during 2 terms) .
Applied Mathematics . . . .
Telegraphy (in Physical Laboratory) .
Telegraph Construction (Workshop) .
Signalling . . . . . .
Accounts (during 2 terms) . . .
Physics (lectures during 2 terms) . .
Mechanical Laboratory (during 6 weeks)

SYLLABUS OF THE COURSES OF STUDY.

N.B.—The matters announced in this Syllabus are liable to be modified from time to time, both generally and in detail.

OBLIGATORY COURSE
FOR ENGINEER STUDENTS.

BRANCH I.—ENGINEERING.

Full marks allotted, without the Architectural Design	**1940**
Ditto, with ditto	**2040**
Marks to be gained for qualification, without the Architectural Design	**776**
Ditto, with ditto	**816**

DESCRIPTIVE ENGINEERING.

First, Second, and Third Years.

Full marks allotted - - - - - 520.

COURSE OF CONSTRUCTION.

1. Classification of the Materials of Construction.

Solid materials.—Stone. Brick. Wood. Metals.
Cementing materials.—Mortars. Cements.
Protecting materials.—Plasters. Paints. Solutions of Salts. Bituminous substances. Metallic Coatings.

2. Of the Structure and Chemical Constituents of N

Structural characters of rocks. The unstratified fied rocks. Characteristics of laminated structure talline structure; slaty structure; granular cryst compact granular structure; porous granular struc rate structure. Characteristics of various fractures uneven fracture; slaty fracture; conchoidal fractu ture.

Chemical constituents of stones.—Silica. Alumin nesia. Potash. Soda. Carbonic acid.

The predominant minerals of stones.—Quartz. blende. Augite. Mica. Chlorite. Carbonate mite.

3. Classification of Building Stones.—Their Charact

Siliceous stones.—Granite and Syenite. Gneiss Greenstone, Whinstone or Trap, and Basalt. Qua stone, Flint. Hornblende Slate. Sandstone, Sili Calciferous Sandstone.

Argillaceous stones.—Porphyry. Clay Slate.

Calcareous stones.—Marble. Compact Limest Limestone. Magnesian Limestone or Dolomite.

Strength and durability of stones.—Testing dur

Preservation of stones.—Bituminous matter. D cate of potash. Silicate of lime.

Artificial stones.

4. Quarrying Stone.

Mode of conducting quarrying operations in I

5. Bricks.

Characteristic qualities of clay for bricks. Single Double and more complex silicates. Porcelain Stourbridge fire clay.

Summary of the processes of brickmaking. Cha ties of good bricks. Expansion of bricks by heat.

Classification of the processes of making bricks. Selection of brick earths. Pure clays. Marls. Loams. Fire clays. Baked bricks distinguished from burnt or vitrified bricks. Cutters. Colours of bricks. Yellow bricks. White bricks. Red bricks. Blue bricks.

Preparation of brick earths.—Unsoiling. Clay digging and weathering. Grinding. Washing.

Tempering the brick earth.—By spade labour and treading. By grinding between rollers. By grinding in a pug mill or pugging.

Moulding bricks. Slop moulding. Pallet moulding. Dry moulding.

Moulding bricks for ornamental purposes. Sizes and shapes of bricks. Hollow bricks.

Drying bricks. On flats. In sheds. In hacks.

Burning bricks. In clamps. In kilns. Common rectangular kiln. Rectangular kiln with arched furnaces. Circular kiln or cupola.

Blue bricks of Staffordshire.

6. Details of Brickmaking in the Neighbourhood of London.

The brick earths employed. Strong clay. Loam. Malm. Artificial malming by the use of chalk. Use of breeze. Use of sand. General arrangement of a London brickworks. Apparatus.

Process of manufacture in a London brickworks. Clay digging. Proportionate quantity of clay. Malming. Soiling. Tempering. Pugging. Moulding. Hacking. Clamping. Construction of the clamp. Firing the clamp. Proportionate quantity of breeze required. Proportionate quantity of fuel. Variations of practice in clamping. The various qualities of bricks made for the London market.

7. Cementing Materials.—Limes.—Cements.—Mortars.—Concretes.

Varieties of natural limestone suitable for mortars and cements; their characteristics.

Chalk, grey chalk, chalk marl, lias limestone, magnesian and carboniferous limestones, gypsum. Limestones used in India. Limestone boulders. Kunkur.

Classification and characteristics of rich limes, poor limes, slightly hydraulic limes, eminently hydraulic limes.

Testing limestone. Analyses of limestones. Lime burning. Slaking lime. Grinding lime.

Mortar making, proportions of sand and water.

Artificial hydraulic mortars; Puzzuolanas, natural and artificial. Trass.

Applying mortar. Grouting.

Hydraulic cements, natural and artificial. Portland cement, its manufacture and use.

Concretes. Materials used. Lime concrete. Cement concrete. Preparation of concrete. Proportions of ingredients. Machinery and appliances for mixing concrete. Block moulding. Monolithic structures in concrete.

Beton, its composition, proportion of materials, its use.

8. Wood.

Structure of wood. Cellular tissue. Vascular tissue or woody fibre. Pith. Medullary rays. Silver grain. Sap. Sapwood. Heartwood. Structure of a branch. Knots.

Classification of Timber according to Tredgold and Rankine.—Class I., Pine Wood; Class II., Leaf Wood.

Class I.—Characteristic qualities and uses of the following woods:—Northern pine, red fir, yellow fir, or Scotch fir, planks, deals, battens. Red pine of North America. White pine or Weymouth pine of North America (frequently called in England "St. John's pine"). Yellow pine of North America. Pitch pine of North America. White fir (Norway spruce), or white deal. Red spruce fir, or Newfoundland red pine. Larch; the European larch; American black larch or hackmatack. Cedar of Lebanon. Juniper or common cedar; Bermuda cedar. Yew. Cowrie.

Class II. Non-coniferous trees.—Division I. Large medullary rays or silver grain distinct.—Subdivision I. Annual rings distinct, one side porous, the other compact. Oak. Common

British oak. The sessile-fruited oak. The Baltic oak; clapboard; Dutch wainscot; German oak. American white oak, commonly known in England as "American oak."

CLASS II., DIVISION I. (continued). SUBDIVISION II.—Annual rings not distinct; texture nearly uniform. The common European beech. Alder. The Oriental plane. Sycamore or great maple.

CLASS II. (continued).—DIVISION II. No distinct large medullary rays.—SUBDIVISION I. Annual rings distinct, one side porous, the other compact. Chestnut. Ash. Elms: The rough-leaved elm. The cork-barked elm. The broad-leaved wych elm. The smooth-leaved wych elm. The Dutch elm. The common acacia.

CLASS II., DIVISION II. (continued).—SUBDIVISION II. Annual rings not distinct, texture nearly uniform. Mahogany, Spanish mahogany, Honduras mahogany. East India mahoganys. The royal or common walnut. Hickory or white walnut. Poplar. Teak.

MISCELLANEOUS.—Saul. Deodar. Jarrah. Greenheart. Lignum vitæ. Babool. Sissoo. Toon. Eyne.

9. Felling Timber.—Seasoning Timber.—Durability of Timber.—Causes of decay in Timber.—Preservation of Timber.

Age of trees proper for felling. Season for felling. Season for barking oak.

Seasoning timber. Natural seasoning. Drying timber. Water seasoning. Steaming and boiling timber. Smoke-drying, scorching, and charring timber. Seasoning, by the extraction of sap. Seasoning, by hot air.

Durability of timber.

Causes of decay in timber, namely:—Continued dryness; continued wetness; alternate dryness and moisture; continued moisture, with heat. Rot, dry rot, wet rot. Destruction of timber by marine animals. By ants.

Preservation of timber.—By good ventilation and obviating mois-

ture. By the use of oil paint. By the application of tar boiled with powdered chalk. When kept wet with salt water. Bethell's process of creosoting. Boucherie's process of injecting sulphate of copper. To cure dry rot. To resist the attacks of marine animals.

10. Varieties and Production of Iron.

General ideas relating to the following subjects:—Sources and classes of iron. Iron ores. Impurities of iron. Cast or "Pig" iron. Wrought or malleable iron. Steel and steely iron.

Magnetic ores. Red and brown hematites. Specular ore. Bog iron ore. Lake ores. Spathic carbonate of iron. Argillaceous carbonate of iron. Blackband ironstone. Cleveland ironstone.

11. Production of Crude or Pig Iron.

Preparation of iron ores. Washing iron ores. Weathering. Roasting or calcination of iron ores. In clamps. In kilns.

The blast furnace and its accessories. External form and construction. Details of the interior lining, or working parts. Construction of the hearth and furnace top. Lifting apparatus. Blowing machines. Cold blast. Hot blast. Blast heating apparatus. Tuyeres. Methods of collecting the waste gases. Form of the interior of the blast furnace. Modes of charging blast furnaces. Tapping. Blowing in. Blowing out.

The fluxes used in iron smelting. Limestone. Argillaceous fluxes. Forge and mill cinders, cinder pig. Formation of blast furnace slags. Composition of slags. Physical characters of slags Afford indications of the interior working of the furnace.

Varieties and composition of pig iron. Appearances of fractures of different classes of pig.

12. Production of Wrought Iron.

Refining or conversion of grey into white cast iron. General arrangements of a refinery furnace. Process.

Production of wrought iron in open fires. The reactions. The charcoal finery.

Reverberatory finery or puddling process. Construction of the puddling furnace. Fettling the hearth. The successive steps of the

puddling process, the manipulation. Conditions of production of various kinds and qualities of wrought iron. The slags. The chemical changes involved in the process.

Forge and mill machinery. Shingling and squeezing apparatus. Tilt hammers. Helve hammers. Steam hammers. Squeezers. Rolling. Rolling mill. Shearing machinery.

Manufacture of finished iron. General summary of process. Piling, reheating and welding. The balling or mill furnace. Piling for finished iron. Billets. Plates and sheets. Armour plates. Shearing machinery for plates. Application of waste heat of puddling and reheating furnaces.

13. Production of Steel.

The manufacture of steel. From pig iron by the Bessemer process. By the Siemens-Martin process. Other processes. The hearth finery process. Puddled steel. Steel-making in crucibles.

Cementation process, blister steel; spring steel; shear steel.

The chemistry of steel making.

Case-hardening malleable iron; malleable cast iron.

Hardening and tempering steel.

14. Preservation of Iron.

Durability, corrosion, and preservation of iron and steel. Galvanizing. Tinning. Oxidising. Other processes.

15. Masonry.

General principles of stone masonry. Ashlar. Block in course. Coursed rubble. Common rubble. Rubble backing. Strength of a mass of masonry as depending on size of stones, the bond, and accuracy in dressing. Bonding, headers and stretchers. Quoins. Direction of beds in battering walls. String courses and copes. Pointing. Drystone masonry.

Mechanism for moving large stones.

Instruments used in building.

16. Bricklaying.

General principles of brickwork. Bond.

Operations of bricklaying. Bond timber objectionable. Mortar joints. Fine joints. Lime putty.

Precautions against settlement. Joining new work to old. String courses and copes. Stone quoins.

Scaffolding.

17. Carpentry.

Joints. Classification of joints in carpentry. Joints for lengthening ties. For lengthening struts. For lengthening beams. For supporting beams on beams. For supporting beams on posts and posts on beams. For connecting struts and ties. Suspending pieces. Pins and trenails. Nails and spikes. Screws. Bolts and washers. Iron straps and stirrups. Iron tie rods. Change of length of iron tie rods due to change of temperature. Iron sockets. Protection of iron fastenings from decay. Built beams and ribs of timber. Trussed beams of timber.

Construction of floors. Naked flooring. Single floors. Double floors. Framed floors. Comparative strength of single and framed floors, having equal quantity of material. Advantage of framed and double floors in respect of the ceiling. Loads carried by floors. Details of single floors. Joists. Trimmer. Trimming joists. Strutting joists. Disadvantage of single floors in transmitting sound. Details of framed floors. Girders. Trussed girders. Flitched girders. Built girders. Binding joists. Bridging joists. Ceiling joists. Precautions to be observed in laying floors, with respect to door and window openings, and partition walls. Cambering floors. Constructions of roofs. King post roof. Queen post roof. Purlins. Rafters. Coverings of roofs.

Construction of scaffolds, staging and gantries. Common bricklayer's scaffold. Scaffolds for stone buildings. Scaffolds for large works in masonry. Gantry. Traveller. Wellington. Staging for works in the sea.

18. Use of Metals in Engineering and Building—Metal Working.

Ironwork in general.—The mechanical properties exhibited in iron. Their great variability. Their experimental determination. Limited utility of mean values, unless accompanied by a knowledge of the corresponding maxima and minima. Tensile strength or tenacity. Strength to resist crushing. Transverse strength. Strength to resist rupture by torsion. Stiffness and elasticity. Ductility. Hardness.

Cast iron.—Processes of making castings from pig iron. Choice of iron for foundry purposes. Melting pig iron in cupola furnace. Ladles.

Patterns, pattern making.

Moulds, foundry sand, loam and metal moulds. Venting moulds.

Pouring molten metal; expansion and contraction of cast iron.

Cooling of the castings. Chilled castings.

Defects of castings. Foundry practices.

Causes producing variation of quality in castings. Tensile strength. Compressive strength. Transverse strength. Torsional strength. Various considerations relating to the ultimate and working strength of cast iron. Stiffness. Ductility. Hardness. Specific gravity. General considerations relating to the use of cast iron. Prices of pig iron and of castings. Summary.

Wrought iron.—Manufacture of marketable iron from puddled iron and from scrap. Rolling. Hammering. Tensile strength. Compressive strength. Stiffness. Elasticity. Ductility. Poncelet and Mallet's co-efficient. Hardness. Texture. Crystalline and fibrous fractures. Red shortness. Cold shortness. Specific gravity. General considerations relating to the use of wrought iron. Variations of quality in different sizes of iron. Large forgings and masses. Armour plates. Small sizes of wrought iron. Wire. Effects of forging. Cold hardening. Annealing. Effect of vibrations. Of repeated loading. Of sudden loading. Of variation in temperature; heat, frost. Oxidation. Preservatives. Galvanic action. Cost of various kinds of wrought-iron work. Different qualities of wrought iron in the market, their uses and values.

Trade marks. Different forms of wrought iron in the market. Summary.

Steel.—Properties, qualities, and uses of the various kinds of marketable steel.

19. Earthwork.

Preliminary arrangements to be undertaken by the engineer. Preparation of plan and sections. Practical stability of earth-work. Of excavation in rocks.

Setting out of earth-work. Base or formation level. Sides or slopes. Half breadths. Computation of volume of a piece of earth-work. Simpson's rule for volumes. Prismoidal formula. Use of tables in such computations. Setting out. Angles. Centre line. Side widths. On side-long ground. Use of the bevil plumb rule, clinometer, mason's level, and boning staves.

Execution of earth-work. The tools and implements used. Size and form of barrows. Distribution of labour. Dobbin carts. Earth wagons. Boring to ascertain nature of ground.

Cuttings. Equalization of cuttings and embankments. Side cuttings. Spoil banks. Stripping the soil. The consecutive operations in forming a heavy cutting. The horse run with large barrows. Casting up by stages. Slips. Drainage.

Embanking and puddling. Preferable materials for embankments. Embankments formed in one layer. In two or more thick layers. Settlement of embankments. Side slopes, facing slopes. Embanking in side-long ground. Foundations of embankments. Punning. Trimming slopes.

Design and Execution of Structures.

The object of this part of the course of Construction is to supplement knowledge of the theory of the resistance of materials and of simple structures, and of the nature, properties and uses of materials, with practical information required in the design and

execution of combined structures. It requires some acquaintance with elementary Applied Mechanics, as well as with the subjects treated of in the previous paragraphs of this course.

1. Design and Execution of Foundations.

Importance of slight and uniform settlement. Various modes of attaining that object. Action of water on foundations. Various conditions dependent on nature of bearing strata.

Importance of ascertaining the character of bearing strata. Trial pits. Borings.

Dry foundations. Rock. Gravel. Sand. Mixed strata of rocks and clay. Shale. Clay. Expansion of clay when exposed. Bearing stratum underlying soft ground of considerable depth. Crust of good ground overlying soft substratum.

Mechanical construction of foundations. Footings. Planking. Use of sand, concrete and béton.

Land foundations on artificial bottom. Consolidation of soft ground by driving piles. Platforms of fascines, timber or concrete, forming floating foundations.

Foundations on good natural bottom under water. Piled foundations. Timber piling. Cast and wrought iron piling. Iron screw piles. Hollow cast iron cylinders. Brick wells, as employed in India. Sand pump. Solid foundations laid under water. Pierre perdue. Random blocks of béton. Béton laid in caissons lined with tarpaulin. Solid masonry built on the natural bottom by divers. Solid masonry in cribs.

Foundations on sites where the water can be temporarily excluded. Solid masonry sunk in caissons on a bottom dredged out and levelled with béton. The same on a piled bottom. Solid masonry built in a cofferdam.

2. Design and Execution of Bridges

Design of road-bridges with masonry arches. With wrought iron plate-girder superstructures, including joints, fastenings, expansion apparatus, and other details.

3. Tunnels and Covered Ways.

Considerations relative to choice of site. Setting out shafts, Ranging the centre line above and below ground. Establishment of bench marks. Trial shafts. Working shafts, excavation, timbering and bricklining. Headings or driftways. Culvert through tunnel.

Covered ways. Roofed with brick arches. With cast iron girders and brick arches.

4. Roads.

Fairweather roads in districts liable to inundations. Permanent roads. Resistance of vehicles on roads variously paved. Ruling gradients. Staking out the centre line. Formation. Breadth and cross section. Earthwork. Side slopes. Culverts and drains. Road metalling. Rolling. Paving with stone blocks. Maintenance and repairs. Hill roads. Street paving in towns.

5. Railways.

Survey and choice of line. Gradients and curves. Resistance of railway trains on a level straight line. On curves and steep gradients.

Formation of roadway. Earthworks. Formation level. Base. Culverts. Regulations about bridges. Level crossings. Fencing. Mile posts. Gradient posts.

Permanent way of railways. Gauge of railways. Ballast. Timber sleepers. Rails. Chairs. Rail joints, fish joints. Cast iron sleepers. Wrought iron sleepers. Cant of rails. Elevation of outer rail on curves. Sidings. Switches and crossings. Turntables.

Railway stations. Design and arrangement. Classification. Terminal stations. Intermediate stations. Selection of site. Details of terminal stations. Approaches, roads and yards. Position of principal buildings. Parallel or side-station system. Transverse or end-station system. Goods stations. Goods yard at small stations. Signals.

DESCRIPTIVE ENGINEERING—*continued.*

Second and Third Years.

COURSE OF HYDRAULIC ENGINEERING.

1. Water Supply.

Amount and variation of rainfall. Evaporation and percolation. Estimation of mean and minimum discharge from a given catchment basin. Flood discharge.

Sources of supply of water to towns. Quantity demanded per inhabitant. Quality of water; mineral and organic impurities.

Arrangements for collecting and storing rain-water.

Supply drawn from artificial drains. Construction of conduits, open and covered.

Supply drawn from streams. Construction of storage reservoirs. Earth dams. Slope and facing of sides. Proportions of puddle trench and wall. Forms of masonry dams; conditions required to be fulfilled in the design and construction. Arrangements for withdrawing water from reservoir; outlet pipes and culvert or tunnel; water-tower and sluices. Separation and discharge of flood water; waste weir and bye-wash. Compensation water.

Supply drawn from rivers. Subsidence basins. Filtration of water, special filters. The laying of the drains from, and the layers of an artificial sand filter-bed. Regulation of rate of filtration. Renovating the filtering surface. Natural filters, filter galleries.

Supply drawn from deep wells. Pumping arrangements then necessary, and in all cases when elevation of source is not sufficient to command district by gravitation. Cornish and rotative engines. Compound Engine. Worthington Pump. Stand-pipes.

Site and advantages of a service reservoir. Construction of covered service reservoirs. Distribution of water supply. Selection of system of pipes. Determination of diameter of pipe

required. Kinds of pipes employed, joints, branches, bends. Pipe track. Fittings. Sluices and stop valves. Hydrants. Air valves. Reflux and flush valves. Meters and house fittings.

2. River Engineering.

Gauging Rivers.—Use of floats and current meters. Woltmann's, Revy's, and Darcy's current meters. Relation of surface, mid-depth and mean velocities. Improvement of Rivers. Defence of banks. Enrochements; fascines; revetment walls; groins; dredging; stopping useless branches. Respective advantages of training walls, groins and dredging in deepening the channel.

Methods of controlling floods. Embankment of rivers. Levees of American rivers. Means proposed to moderate floods. Modes of transport by water. Screw tugs. Submerged wire rope.

Canalization of rivers. Construction of weirs, of timber, rubble and masonry. Effect of weirs on stream bed.

Arrangements for discharging flood waters over weirs. Weirs with movable sluices. Weirs with falling shutters. Fouracres' hydraulic brake. Self-acting weirs. Siphon weirs. Construction of river locks. Conditions to be attended to in designing lock walls. Pressure of gates on walls.

3. Artificial Canals.

Lateral canal. Summit canal. Cross section of canal. Feeder to canal. Waste weirs. Passage of streams. Aqueducts. Siphons. Losses of water in canals.

Reservoirs for supplying canals. Cuttings and embankments. Puddling canals. Construction of canal locks. Form and construction of Lock gates.

4. Sanitary Engineering.

Collection of sewage. Quantity. Surface water. Drainage of subsoil water. Construction of sewers and pipe drains. Branches. Man holes. Arrangements for flushing sewers. Ventilating arrangements. Gullies. Traps.

Sewage disposal. Systems of sewage irrigation. Precipitation processes.

5. Works of Irrigation in India.

Irrigation.—Well irrigation in India. Tank irrigation. Canal irrigation. Combination of irrigation and navigation.

Irrigation of deltas in Southern India. Weirs or annicuts. Irrigation by interception of head waters of rivers as in Italy and in Upper India. Estimation of discharge available. Capacity of canal. Head works; intercepting weirs and sluices. Slope of bed and width of channel. Alignment of the canal. Foundations for canal works. Dams. Weirs. Falls. Rapids. Locks. Crossing torrents. Diversions. Aqueducts. Inlets. Level crossings. Superpassages. Regulating bridges. Escapes. Distributing channels.

COURSE OF MECHANICAL ENGINEERING.

1. Description and Construction of the Elementary Pieces of Machines.

Shafting. Couplings. Clutches. Friction clutches. Plummer blocks or pedestals. Fixings; wall boxes; brackets; hangers. Footsteps. Bolts and nuts.

Tooth gearing. Spur wheels. Racks. Bevil wheels. Worm gearing. Modes of fixing wheels upon shafts.

Driving belts. Drums and pulleys. Fixing drums and pulleys upon shafts. Rope transmission. Telodynamic transmission.

Cranks. Eccentrics. Cams. Connecting rods.

Valves. Pistons. Stuffing boxes.

2. The Steam Engine.

Fuel and Combustion.—Chemical composition and physical properties of the different kinds of fuel. Calorific value of some elements, and their compounds. Determination of the calorific value of the different kinds of fuel. Process of combustion. Formation of smoke and flame. Losses by incomplete combustion. Air necessary for combustion. Temperature of combustion. Density of burnt gas. Maintenance of draught, by convection; by artificial means. Transmission of heat from furnace gases. Waste of heat. Methods of stoking. Mechanical stokers.

The Boiler.—Types of boilers. Proportions to provide sufficient grate and heating surfaces. Proportions and methods of construction to provide sufficient strength. Construction to facilitate cleaning and examination. Boiler fittings.

The Steam Engine in General.—Types of Engines. Horse-power. Relations between dimensions of cylinder, speed of piston or revolution, and power of engine. The design of the principal details of an engine. Piston, piston rod, connecting rod, crank shaft. The slide valve and excentric. Link motions. Expansion valves. The Indicator and Indicator diagrams. The condenser and air pump.

The Locomotive Engine.—Train resistance. Tractive power. Adhesion. Express and coupled engines. General description of ordinary engines. Goods' engines. Limit of load on wheels. Fatigue of rails. Description of engines for exceptional circumstances. Engines for steep inclines. Engines for exceptionally heavy trains on moderate inclines. Engines for narrow gauge lines. Double traction. Fairlie engines.

General arrangements of engine and boiler. Reversing. Expansive working. Webb's compound engine. Brakes. Framing. Axle boxes. Springs. Axles. Wheels. Effect of curves on wear of tires. Provisions for reducing the effect of sharp curves. The tender. Ramsbottom's scoop.

3. Hydraulic Machines.

Motors.—Source of energy. Available power of a waterfall. Storage of energy in accumulators.

Water wheels. Overshot, breast, and undershot wheels. Suspension principle. Velocity of wheel periphery. Forms and proportions of buckets. Poncelet's wheel.

Water pressure engines. Power varied by variation of length of stroke.

Reaction wheels. Barker's mill.

Turbines. Use of guiding vanes. Outward flow turbines. Fourneyron's arrangement for varying the power. Callon's arrangement.

Axial flow turbine. Girard's turbine. Hydro-pneumatic arrangement for preventing drowning of wheel. Suspension of wheel. Fontaine's method of regulating the power.

Inward flow turbine. Thomson's wheel. Regulation of power by movement of guiding vanes. Fluctuation of speed less in inward than outward flow turbines.

Pumps.—Power required to drive pumps. Reciprocating pumps. Lift, plunger, and double-acting pumps. Construction of valves. Downton's pump.

Centrifugal pumps. Radial vane wheels. Appold's pump.

Jet pump. Hydraulic ram.

Hydraulic lifts. Bramah's press. Hydraulic cranes. Testing machines. Riveting, shearing, and punching machines.

SURVEYING.

First and Second Years.

Full marks allotted - - - - 360.

FIELD WORK.

FIRST YEAR'S COURSE.

1. Use of Instruments.

Use and adjustments of the various instruments employed, viz.:

Prismatic compass. Plane table. Sextant. Y level. Gravatt's or Dumpy level. Theodolite. Mountain barometer. Aneroid barometer.

2. Chain Surveying.

A small extent of country to be surveyed, and all interior details filled in with the chain only, under personal instruction of the Professor. The class will then be subdivided into smaller parties, and independent surveys made by each.

3. Compass and Chain Survey.

A small road survey will be made with compass and chain.

4. Levelling.

A line of levels to be taken over undulating country with Dumpy or Y level, under personal instruction of the Professor.

The class to be then subdivided into small parties, and to run independent lines of check-levels in various directions, commencing from and closing upon certain selected bench marks.

5. Surveying with Theodolite.

About two or three miles of road to be traversed with theodolite, by the "back angle" method.

A small circuit to be traversed, according to Gale's method.

Second Year.

Tracing curves.

Ranging out and measuring a base line for a small trigonometrical survey.

Selection of stations and completion of the triangulation from the above base.

The interior details of this triangulation to be filled in, either with prismatic compass and chain, or with plane table, or both, and the necessary contours to be run.

6. Practical Astronomy.

Observations of sun or star for the determination of the true meridian, time, and latitude.

[On the completion of the above course, the Students will be employed on Engineering Surveys for a road or canal, as a preparation for the projects to be executed in their third year.]

7. LECTURE-ROOM COURSE.

Construction of scales. Simple, diagonal, and vernier.

Useful problems in surveying, viz.:—

To avoid obstacles in the chain line.

To find the intersection of two lines meeting in a lake or river, and the distance to the point of meeting.

To find your place in a survey by observation from that position to certain fixed points on the survey.

1st. With prismatic compass.

2nd. With sextant.

Investigation of the various methods of tracing curves.

Plotting and colouring surveys and level sections.

Computation for the reduction of the base line.

Reduction to the centre, of angles taken from satellite stations.

Calculation of the sides of the triangles.

Calculation of the relative vertical heights of the stations:

(*a*) As determined by theodolite.

(*b*) As determined by barometer.

Method of entering the topographical details. Shading hill features in mezzotint.

Conventional signs used in surveys and plans.

8. Astronomy.

Computations for the determination of—

The true meridian.

Time.

Latitude.

THE ELEMENTS OF ARCHITECTURE.

First and Second Years.

Full marks allotted - - - - - 100.

A course of elementary lectures, to include the history of architecture, a description of the various styles, with some account of the more important characteristics of each, the principles of design, the planning of buildings, and the elements of the art of house-building.

GEOMETRICAL DRAWING.

First and Second Years.

Full marks allotted - - - - - 350.

This part of the course will consist of exercises of the following kind. The student will be required to execute a certain number of drawings of each class, and to become proficient in the simpler exercises before proceeding to the more difficult ones.

Instruction in descriptive geometry will be given partly in the form of class lectures, and partly by means of exercises performed under instruction.

Practical Geometry.

Plane Geometry.

Construction of scales, plane and diagonal; use of sector; construction of the regular polygons; delineation of geometrical patterns; reduction of irregular polygons to triangles; delineation of circular arcs when centres are unavailable; delineation of various curves; parabola, ellipse, hyperbola, cycloid, epicycloid, involutes, Ionic Volute, spirals; Roman and Greek ovolo, &c. Miscellaneous problems relating to the ellipse; miscellaneous problems relating to lines, circles, and plane figures.

Solid (or Descriptive) Geometry.

Miscellaneous problems of lines and planes represented by plan and elevation. Determination from various data of the projections of solids, *e.g.*, cube, tetrahedron, octahedron, dodecahedron, icosahedron, also cones, cylinders and surfaces of revolution. Representation of solids by contoured projections and by section lines; determination of tangent planes to curved surfaces; development of curved surfaces and of lines lying on them; intersections of various surfaces and delineation of the resulting curves of double curvature; development of skew arches. Ruled surfaces, helicoidal and conoidal. Projection of shadows and cast shadows; shadows cast upon plane and curved surfaces by various solids, when the rays are parallel. Principles of shading. Isometric projection, construction of isometric scales; application of isometric projection to various objects.

Perspective.

Principles and practice of perspective or radial projection; application to circles, polygons, geometrical patterns, various solids and other simple objects.

Architectural and Constructional Drawing.

Enlargement of copies of various subjects and drawings to scale from rough dimensioned sketches. Detailed drawings of various

examples of building construction:—*e.g.*, framing and scarfing timber; doors, windows, guttering, slating; flooring, single, double, and double framed; fire-proof flooring; wooden trussed roofs; staircases and miscellaneous constructional details; brick bonds; brick arches and sewers; ashlar work and cornices; arrangement of chimney flues in a party-wall.

Plans, sections, and elevations, coloured, shaded and finished drawings of buildings. Perspective and isometric views of buildings. Shaded studies of ornamental architectural details.

Mechanical Drawing.

Projections of screws; delineation of the teeth of wheels; projections of spur, worm, and bevil wheels, fly wheels; delineation of various forms of cams.

Plans, elevations and sections of engines, stationary and locomotive. Detailed drawings of working parts. Drawings of miscellaneous machines; pumps, water-wheels, turbines, cranes, windlasses, drilling-machines, lathes, &c. Isometric projections of parts of machinery.

Drawings to scale from models or actual objects.

Engineering Drawing.

Detailed and working drawings of engineering constructions, *e.g.* foundations, walls, cuttings, embankments, cofferdams and docks; wooden-trussed bridges and temporary bridges; iron bridges, cast and wrought; stone and brick bridges; iron roofs; trussed-beams, gantries, scaffolding and centerings.

Details of railway work, crossings, switches, turntables, &c.

ESTIMATING.

Third Year.

Full marks allotted - - - - 80.

General principles of estimating. Rules of mensuration of surfaces and solids.

The student will be exercised in taking out quantities and framing an estimate from working drawings of the following examples:

A masonry culvert. A portion of road in cutting and embankment. A house. A wooden bridge. An iron bridge. A masonry bridge.

ACCOUNTS.

Third Year.

Full marks allotted - - - - 70.

1. First principles of Accounts.

Single and double entry.

Limits of application of single entry accounts.

Double entry. Nature of record. Meaning of terms Dr. and Cr. Continued adjustment by means of. Limits of error possible in.

Books of record needed for double entry accounts. Primary record. Ledger. Journal.

Cash book, its relation to ledger and other accounts.

Vouchers, different kinds of.

Subsidiary ledgers, nature of.

Balance Sheets.

2. Mercantile Accounts.

Books for bills payable and receivable. Invoices. Bills of Lading. Warehouse and store accounts.

3. Banking Accounts.

Special features of, as compared with mercantile accounts.

4. Government Accounts.

Radical difference between Government and mercantile accounts; the one based entirely on cash transactions occurring within fixed definite periods, the other upon liabilities and claims outstanding.

Relations of Government accounts to parliamentary appropriations. Exchequer credits and appropriation audit.

5. Accounts of Indian Public Works Department.

Form of these accounts determined by two conditions: that expenditure is limited by annual grants, and that the department is a manufacturing agency.

System of annual appropriations. Comparison of Indian as compared with English system of annual grants; degree of latitude allowed to the engineers in the application of the funds at their disposal.

Public Works Accounts; divisible into three main parts: original accounts of disburser; abstracted accounts of the responsible engineer; final record in audit office.

Accounts of disburser. Forms of cash account. Imprest and current accounts. Nature of voucher required as evidence of payment. Work accounts. Various modes of economising labour and space in recording results.

Contractors' accounts. Different cases of contract work. Labour only by contract. Labour and materials both contracted for. Work done by various contractors. Work done by one contractor only. Simplest mode of recording these transactions.

Store and manufacture accounts. Mode of charging stores consumed against the works on which they have been used. Compen-

dious modes for abbreviating labour in striking balances. Mode of checking balances. Store-taking.

Accounts of the engineer. Mode of abstracting transactions of his subordinate disbursers. Mode of dealing with stores. Transfer accounts with other officers and departments. Divisional abstract of expenditure and receipts, the record on which the audit is based. Ledger and journal. Store ledger. Monthly balance sheet. Distinction between 'personal' and 'service' accounts.

Accounts of audit office. Two main records. Journal and Ledger. Difference between Journal of executive engineer and that of audit office. Journal used in Public Works Department; its special features. Principle which underlies all good accounting, that the process of abstraction and condensation should be continuous throughout the books.

Accounts of an Indian province. Annual appropriation account.

Accounts of the Indian empire. Mode of compiling them.

6. Accounts of Railway and Irrigation Works.

Twofold conditions involved, since these partake of the character of both government and mercantile accounts:—1st. Accounts of year must be based upon cash transactions occurring within it. 2nd. Profits must be recorded.

Revenue and Capital accounts.

7. Accounts of Manufactories.

PROJECT.

Third Year.

Full marks allotted - - - - - 140.

The Project constitutes one of the exercises to be performed during the third year.

Each member of a small party of students will be required to make a survey for a portion of a road, railroad, or canal, through some district of country in the neighbourhood of the College; to select the line; to make a traverse and run the needful levels, with cross sections, along the line selected; to lay down the line in plan and section, with necessary details; and finally, to prepare an estimate of the earthwork.

ENGINEERING DESIGN.

Third Year.

Full marks allotted - - - - - 100

A specification of an engineering work will be given, and the student will be required to produce a general design and full detail drawings, sufficient for its actual execution. With the drawings there will also be prepared a note-book, containing a general account of the design adopted and a record of all the calculations made for it.

The subject of the design may be an iron or masonry bridge for a road or railway, or a roof for a railway station or other large building.

MECHANICAL AND HYDRAULIC ENGINEERING DESIGN.

Third Year.

Full marks allotted - - 100.

The subject of the design will be either a work of construction, such as a canal lock and gates, an aqueduct, or reservoirs and filter-beds; or it may be an arrangement of machinery, such as a turbine, steam-engine, or pumps. Drawings and note-book as for the engineering design.

ARCHITECTURAL DESIGN.

Third Year.

Full marks allotted - - - - - 100.

The design to be prepared will be for a public or other building, as *e.g.* a hospital, school, small church, warehouse, court-house, railway-station, &c. This design may be omitted, and an advanced course in either the Chemical or Physical Laboratory substituted.

WORKSHOP.

First Year.

Full marks allotted - - - - 30.

First Year Students will attend in the Workshop during the first half-session one afternoon in each alternate week, and will be instructed in the simpler operations belonging to the trades of the blacksmith and the whitesmith. Other workshop processes may be practised in the Optional Courses of the First and Second Years.

MECHANICAL LABORATORY.

Third Year.

Full marks allotted - - - - - 60.

In the Mechanical Laboratory the tensile, compressive, transverse and shearing resistance of iron and steel specimens will be tested by the students, and observations made of the moduli of elasticity. Instruction will be given in the use of accurate measuring-instruments, and in reducing and plotting experimental results. Students may also be occasionally employed in testing cements, brick, or stone, or in testing lubricants, or in determining hydraulic coefficients by experiment.

BRANCH II.—APPLIED MECHANICS.

Second and Third Years.

Full marks allotted - - - - -	800.
Marks to be gained for qualification -	200.
Full marks allotted, optional - - -	300.

COURSE OF CONSTRUCTION.

Full marks allotted, obligatory - -	400.
,, ,, ,, optional - - -	150.

I. The Theory of the Resistance of Materials and Stability of Structures.

1. Preliminary Definitions and Ideas on the Elastic Resistance of solid Pieces.

Deformation. Elasticity.

Perfect and imperfect elasticity. Proportionality of the deformation to the force producing it. Permanent set. Statical breaking strength or ultimate strength.

Longitudinal or direct strain. Tensile and compressive strain. Cross, transverse, or normal section. Lateral strain. Elementary fibre. Centre of area. Mean fibre.

The external forces. Their equilibrium. Loads. Reactions. Straining actions.

Stress. Tensile and compressive stress. Resultant of such a stress. Intensity of stress.

Rankine's definitions of strain and stress. Internal stress. Pressure.

Uniform stress, varying stress, and uniformly varying stress. Centre of stress: its determination. Moment of area. Neutral axis of a varying stress. Moment of inertia and product of inertia of a surface. (Definitions only; see No. 7.)

Equilibrium of the stress on a section with the external forces. A uniformly varying stress whose resultant is a couple.

Normal, direct, or longitudinal stress. Normal intensity of a stress. Oblique stress. Tangential or shearing stress. Resolution of oblique stress into normal and tangential components.

2. Resistance of Straight Pieces to Simple Longitudinal Extension and Compression.

Law of longitudinal elastic resistance, established by experience.

Expression of the law of longitudinal elasticity. Coefficient or modulus of longitudinal elasticity (E). Coefficients of lateral strain (η).

Conditions of exactitude. Isotropic solids. Effects of various modes of applying the external forces.

Homogeneous and heterogeneous prisms. Longitudinal stiffness of a prism. Centre of elasticity. Mean fibre. Examples of longitudinal stress. Utility of the coefficients E and η.

Limits of elasticity. Permanent deformations occurring within the limits of elasticity are not indications of weakness.

Distinction between the conditions of immediate fracture and fracture at an indefinitely distant time. The strain-limit of elasticity. The stress-limit of elasticity. Limits of intensity of working stress. Proof stress or proof resistance. Proof load. Factors of safety.

Examples of application of preceding formulæ. Always attend to the homogeneity of the numerical equation.

Work of longitudinal deformation. Effect of load gradually applied. Effects of external forces suddenly applied. Effects of shocks. Resilience. Poncelet's coefficient. Modulus of resilience.

Examples of application. To pieces not prismatic. A tie-bar may be weakened by partial increase of section.

Greatest intensity of stress permissible in structures liable to shocks, and to the more or less sudden application of a moving load.

Remarks on the resistance of elastic materials to compressive stress and crushing.

3. Specific Constants and Practical Data relating to Longitudinal Extension and Compression.

Specific constants, their utility and numerical values.

Chains and ropes.

Effects of climate and of changes of temperature on the resistance of materials.

4. Sliding and Resistance to Sliding Parallel to One Plane.

Sliding. Shearing force. Shearing stress. Definition and measure of sliding parallel to one plane. Sliding in one direction is always accompanied by an equal sliding in the direction at right angles to the former.

Every sliding, in a pair of given rectangular directions parallel to one plane, produces tensile and compressive strains in other and different directions in the same plane and conversely. Theorems demonstrating their relations.

Shearing stress, or tangential stress. Its measure and intensity. Coefficient (G) of transverse elasticity. Maximum simultaneous direct stresses.

Determination of G, E and η (see No. 2) in terms of one another. Experimental values of G for some materials. Theoretical determination of η for an isotropic solid.

Limit of working intensity of shearing stress in terms of the known limit of working intensity of longitudinal tensile stress in isotropic solids. Case when it depends upon the working resistance to lateral flexure caused by compression.

Application to rivets, bolts and cotters. Conditions which make

the sliding and the intensity of shearing stress on a section uniform or variable. In many cases they vanish at those parts of the contour of the section which are normal to the plane of sliding.

5. On Principal Strain and Principal Stress. Their Relation to Strength.

Combined longitudinal strains and sliding. Principal strains. Principal stresses.

Limiting principal strain. It is the principal *strain*, rather than the principal stress, that needs to be limited.

6. Resistance of Pieces to Flexure produced by External Forces acting in one Plane perpendicularly to their Length.

Division of the subject. Definitions of beam, cantilever, girder, continuous beam. Flexure of a homogeneous prism *encastré* at one end. Bending couple or bending moment. Shearing force. Plane of solicitation. Shearing stress, or resistance to sliding. The stress couple, or moment of resistance. Neutral axis. Neutral surface. Validity of the hypothesis tacitly assumed.

Analysis of the flexure of a prism when the primitively straight mean fibre is deformed into an arc of a circle. Moment of inertia and radius of gyration of a section. Equation and moment of elasticity. Equation and moment of resistance to flexure. Alteration of the primitive contours of the normal sections.

General ideas respecting flexure unequal or non-circular. Slidings which then necessarily occur. Curvature and inflexion of the primitively plane and normal sections. Theory of flexure only applicable within the limit of elasticity.

Examples of loaded cantilevers.

Investigation of the general case of flexure unequal or non-circular. How to compute approximately the slidings and shearing stresses.

Example of unequal flexure in a rectangular beam. Cases in which sliding is and is not important. Definition of "booms" or "flanges" and "web" of a girder.

Investigation of the theory of non-circular flexure continued. Equation of the inflected curve in the plane of solicitation assumed by the trace of the primitively plane and normal section. Example. How to trace the curve.

In a piece subject to flexure, the shearing stress on a section compelled to remain plane is of uniform intensity.

Equations of shearing stress, sliding, and of the curves assumed by the primitively plane and normal section when the latter is an assemblage of rectangles.

The shearing force is equal in magnitude to the first derivative of the bending moment, but has sometimes the same and sometimes the opposite sign.

Statement of proportions of breadth to depth of section for which the approximate formulas of shearing stress and sliding are applicable.

Primitive state of a piece whether straight or slightly curved Primitive mean fibre. Deformed mean fibre.

Deflection due to flexure. Differential equation of the deformed mean fibre.

Straight beam resting horizontally on two supports at its extremities, and supporting stationary loads. Determination of bending moments, shearing forces, and deflections in various ordinary cases.

Resilience of a beam so supported and loaded in the middle.

Generalization of the various cases of loading. A beam supported at its two extremities, and subject to the action of any number of stationary loads, either concentrated or continuously distributed, whose directions are normal to the primitively straight mean fibre. Criterion for determining the point of maximum bending moment.

Limits of deviation of the point of maximum deflection, due to any loads, in a beam supported at its two extremities.

Examples of the preceding cases.

One or two concentrated loads moving from one end to the other of a beam supported at its two extremities.

A beam supported at its two extremities carries a fixed load of uniform intensity, and also a moving load of uniform intensity

travelling from one end to the other, and finally covering the whole span. Greatest bending moment and shearing force on any given section.

7. Moments of Inertia of Plane Surfaces.

Properties of moments of inertia of a plane surface referred to axes intersecting the centre of area in various directions. Ellipse of inertia, principal moments of inertia, principal radii of gyration, and principal axes of the surface at any point in its plane.

Properties of principal axes and principal moments of inertia of a plane surface.

Polar moment of inertia of a plane surface. Constancy of the sum of every pair of moments of inertia round rectangular axes, in the plane of the surface, traversing the same origin.

Moment of inertia of a plane surface round any axis in the plane, in terms of the moment of inertia round a parallel axis in the same surface traversing the centre of area.

Central principal moments of inertia and radii of gyration of various symmetrical plane figures.

Magnitude of the ellipse of inertia. Moment of inertia round any axis traversing the centre of the ellipse in terms of the principal moments.

Principal axes and principal moments of inertia of non-symmetrical plane surfaces.

How to calculate the product of inertia.

Example, central principal moments of inertia of the section of an unequal-sided angle-iron.

8. Digression on the Principles of Graphic Statics.

The polygon of forces.

Equilibrium of a set of external forces acting in one plane on a rigid body, or system of bodies, and not meeting at one point.

Equilibrium of a closed articulated polygonal frame. Funicular polygon. Its closing line. The force diagram.

Relation between different funiculars of the same set of forces. Any one of these being given to draw any other. Consequences.

The graphic conditions of equilibrium of forces acting in one plane on a rigid body or system. Constructions giving the resultant. Examples.

Equilibrium of an open articulated polygonal frame fixed at its extremities. The funicular and polygon of Varignon. The polygon and curve of pressures. Funicular curve.

Polygonal frame under parallel external forces.

Graphic construction of the resultant of a system of parallel forces. Special constructions for the resultant of two parallel forces. Examples.

Graphic constructions for the centre of gravity of a system of bodies (or of a single body divided into parts) whose respective centres of gravity are known, whether situated in one or in different planes. Examples.

Centre of area of a plane surface or section. Special graphic constructions for the centres of area of certain plane figures, and for that of a plane surface made up of parts whose respective centres of area are already known. Examples.

9. Application of Graphic Statics to the Determination, without Calculation, of Reactions, Shearing Forces, and Bending Moments in Girders Resting Freely on Two Supports at the Extremities and Loaded between Them.

Fixed concentrated loads. Reactions. Shearing force. Bending moment.

System of concentrated moving loads. Maximum shearing force at a given section.

Maximum bending moment at a given section due to a system of concentrated moving loads, spaced at given distances apart.

To find the position of the section of absolute maximum bending moment due to a system of concentrated moving loads.

Girder carrying a fixed load continuously distributed and of varying intensity, either alone, or combined with concentrated fixed loads. Reactions. Shearing forces. Bending moment.

Continuous fixed load of uniform intensity.

10. Cast and Wrought Iron Girders.

Approximate Methods of computing the dimensions of cast and wrought iron girders of tee and double-tee section, required to resist given bending moments. Cast-iron beams. Rolled wrought-iron beams.

Typical sections. Moments of resistance.

Case I.—Double-tee sections. Case II.—Single-tee sections.

Remarks on the practical application of Cases I. and II.

Case III.—Built-up wrought-iron beams.

Examples of the preceding Approximate Methods.

11. Simple Torsion, and Torsion Combined with Flexure.

Resistance to simple torsion of a homogeneous cylindrical prism. Twisting moment. Angle of torsion. Twist. Moment of torsion. Limiting intensities of stress in various circumstances.

How to deduce the twisting moment from the horse-power transmitted. Diameter of section in terms of horse-power.

Resistance to torsion of pieces whose sections instead of being circular, are either elliptical, rectangular, square, or equilaterally triangular, the transverse contexture being uniform. Results stated without demonstration for reference only.

Resistance of a round axle or shaft to a bending moment and twisting moment acting together on the same section. The limiting principal strain. Limiting deflection of the shaft.

Example I.—A round shaft of given diameter subject to loads producing given twisting and bending moments. To find the intensity of stress corresponding to the greatest principal strain.

Example II.—A spur fly-wheel shaft. To find the twisting moment. The greatest bending moment. The position of the dangerous section. To find the diameter at the journals where it is least.

Example III.—The same with the pinion shifted. To find the moment of the resultant of two bending couples acting in intersecting planes. Diameter of the journal.

Other examples.

12. Short Pieces Loaded on End Excentrically.

Short pieces approximately prismatic loaded excentrically, that is, by forces with lines of action parallel to the mean fibre.

Deformation experienced by the piece. Limits of application of the preceding. Plane joint.

Application of the preceding to rectangular and circular sections, and to plane joints.

13. Rankine's Formulas for Long Pillars.

Resistance of long pillars and struts to external forces whose resultants act along the mean fibre. Cast-iron hollow columns.

14. Theory of Continuous Girders.

Load on any one span uniform, section of beam uniform. Mean fibre primitively straight, therefore all points of support in a straight line. Theorem of the three moments. How to compute the reactions.

Examples of the preceding.

15. Masonry Structures.

Stability and resistance of structures in masonry. Conditions of stability. Navier's hypothesis. Centre of pressure of a plane joint.

Limits to position of centre of pressure. Condition of economy of material.

Moment of stability. External moment.

Polygon of centres of pressure or line of resistance. Curve or line of pressures.

Methods and limits of application of the working equations.

Treatment of counterforted walls and abutments and attached buttresses.

Application to structures of cemented blocks able to resist tensile actions within the limits of adhesive strength of the mortar. Even so, tensile stress is not admissible in certain cases.

Ultimate strength of stones, bricks, and mortars, and adhesion of mortars. Factors of safety.

Values of the coefficient of friction in masonry. Factor of safety for frictional stability.

Pressure of masonry structures on earth foundations. On concrete. Footings.

Examples.

Application to retaining walls. Case where the back of wall is approximately vertical, and the top of bank approximately horizontal. Example.

Pressure of earth against wing walls, and the abutments of arched bridges.

Stability and resistance of masonry arches. Voussoirs, abutments.

Example of a bridge of single span built in stone masonry. Fixed load. Non-symmetrical surcharge. Extrados of total load. Division of load. Load on voussoir. Conditions of stability of the arch. The principle of least resistance. Symmetrical surcharge. Assumptions concerning the trial line of resistance. To draw a trial line of resistance. Table and areas and moments for the trial line of resistance. Joints of rupture. To draw the line of least resistance which is consistent with the condition of stability of position. Table of areas and moments for the line of least resistance. Abutments and piers. Counterforts. Correction for load on voussoir joint. To draw the intrados of an oval arch made up of circular arcs. Method for 3-centred arch. Method for 7-centred arch. Method for a 5-centred arch. Arches of other ordinary forms.

Stability of reservoir dams in masonry.

16. Theory of Framework. Method of Sections.

Definition of a frame. Articulated and non-articulated joints.

External forces.

Stress in the bars of a frame.

Equilibrium at a section.

Formulas of the method of sections. The three equations of equilibrium of a segment cut off by a section.

Application to trusses and framed girders.

Example of an unsymmetrical frame illustrating the application of the method of sections.

Examples of the application of the method of sections to simple roof trusses under vertical loads only.

17. Framework continued. Application of the Method of Sections to Framework Girders used in Bridges and Analagous Structures carrying Vertical Loads only.

Booms and Web. Various forms of girders.

Types of girders of uniform depth.

Bays or panels, struts, and ties.

Fixed and moving loads. Counterbracing.

Examples of the application of the method of sections to framed girders.

18. Framework continued. Determination of the Stresses in Girders with Parallel Booms by the Method of Superposition.

Principle of the method of superposition applied to fixed and moving loads equally divided among the joints on which they respectively act.

Stresses in the web bars; due to fixed load; due to moving load.

Stresses in the bays of the booms due to both loads.

Examples.

19. Grapho-Statical Determination of the Stresses in the Bars of Framework.

Definitions. Henrici's notation.

Equilibrium of an unbraced polygonal frame. Frame-polygon. Force-polygon. Force-diagram. Stress-diagram.

Equilibrium of a braced frame. Application of the funicular polygon to determine reactions. Stresses determined by Clerk-Maxwell's stress diagram.

To determine the directions of the reactions of roof trusses and similar structures.

Various examples of roof trusses. Fixed vertical loads. Normal pressures due to wind blowing horizontally. Both ends of the truss fixed. One end fixed, the other supported on expansion rollers.

20. Trussed Beams.

Trussed beams of simple form treated graphostatically and by the method of sections.

Fink's truss.

21. Parabolic Bowstring Girders.

Description and definitions.

Depth of Girder. Stresses in the booms. Graphic calculation of maximum stress in the bow. Areas of sections of the booms.

Maximum stresses in the bars of the web. Web of single triangulation with vertical and diagonal bars. Graphic calculation for the diagonals.

Web of double triangulation with crossed diagonals and vertical bars.

Graphostatical treatment of bowstring girders not parabolic or else loaded irregularly.

Examples of parabolic bowstring girders, with single and double triangulation respectively, with fixed and moving loads of uniform intensity.

22. Riveted Joints.

Definitions. Lap and butt joints. Single and double riveting. Chain and zig-zag riveting. Pitch. Lap. Gross and net section. Single and double shear.

General formulas for the resistance of riveted joints.

Coefficients of resistance. Original strength of unperforated plates and bars. Shearing stress. Bearing pressure. Tensile strength of the net section. Resistance to tearing out.

Resistance of riveted joints. Joints of equal resistance. Single riveted lap joints. Single riveted butt joint with single cover. Double riveted lap joint. Double riveted butt joint with single cover. Single riveted butt joint with two covers. Double riveted butt joint with two covers.

Frictional resistance.

Width and thickness of cover strips or joint plates.

Efficiency of riveted joints. Single riveted lap joint or butt joint with one cover. Double riveted lap joint or butt joint with

one cover. Single riveted butt joint with two covers. Double riveted butt joint with two covers.

Multiple riveting. Group riveting. Uniform stress.

Resistance of group and multiple riveted joints.

Group riveted joint of greatest economy for a tie-bar.

Riveted joints in compression.

Long rivets. Caulking. Forms of rivets.

Tables of pitch and diameter. Table I.—Single riveted lap joints and butt joints with one cover. Table II.—Double riveted lap joints and butt joints with one cover. Table III.—Double riveted butt joints with two covers.

Joints of the shells of cylindrical boilers.

Examples of application.

COURSE OF HYDRAULICS AND MECHANISM.

Full marks allotted, obligatory - - - 400.
„ „ „ optional - - - 150.

Hydraulics.

1. General Principles.

Velocity and volume of flow. Principle of continuity. Flow in a stream. Steady and varying motion of streams. Fluid acting on piston. Theorem of Bernouilli. Hydraulic head.

2. The Flow of Liquids through Orifices.

Application of the theorem of Bernouilli. Velocity of flow due to given head. Co-efficient of velocity. Co-efficient of contraction. Co-efficient of discharge. Co-efficient of resistance. Connection between co-efficients of velocity and resistance. Discharge from large rectangular orifices. Borda's mouthpiece. Co-efficient of contraction for Borda's mouth-piece obtained theoretically. Incomplete contraction. Cylindrical and conical mouth-pieces. Flow over notches. Triangular notches. Velocity of approach.

Application of results to measurement of flow in streams. Francis' formula. Discharge of measured quantities of water for irrigation purposes. Italian and Spanish Modules. Other forms of apparatus answering the same purpose. Discharge under varying head. Jet pump. Separating weirs.

3. The Flow of Liquids in Pipes.

Laws of friction between liquids and surfaces. Froude's and Unwin's experiments. Loss of head due to friction in pipes. Hydraulic mean depth. Variation of co-efficient with velocity and diameter. Darcy's formulæ. Hydraulic gradient. Ordinary computations of size of pipes and volume of discharge. Loss of head due to bends, elbows, enlargements, valves, &c. Branched pipe connecting reservoirs of different levels.

4. Movements of Water in Canals and Rivers.

Mean velocity corresponding to given gradient. Variation of the co-efficient. Velocity at different parts of the section of the stream. Mean velocity in terms of surface and bottom velocity. Ratio of mean to maximum velocity. Forms of section of channels, circular, trapezoidal, egg-profile. Most economical section of channel with given side-slopes. Form of section for a constant velocity with varying discharge.

5. Impulse and Reaction of Water.

Pressure of a jet on a plane surface fixed or moving. Energy communicated to the moving surface and efficiency of jet. Velocity of surface for maximum efficiency. Resultant pressure on curved surface, direct impulse and reaction. Condition to avoid loss by shock when jet is received. Condition for least loss of kinetic energy when jet is discharged. Resistance of ship-shape bodies.

6. Hydraulic Machines.

Transmission of energy by hydraulic pressure. Power of hydraulic motors. Causes of loss of efficiency in water-pressure engines, pumps, accumulators, and water-wheels.

Principle of momentum as applied to rotating machines; turning couple equal to the change of moment of momentum.

Speed for maximum efficiency and losses in reaction wheels.

Most efficient speed of turbines. Angles of moving and guiding vanes. Forms of vanes. Losses of efficiency. Regulation of power of turbines. Estimation and graphical representation of the diminution of total and pressure-head in flow through a turbine.

Centrifugal pumps with radial vanes. Speed for given lift with given efficiency. Utilization of kinetic energy of whirl. Best form and dimensions of spiral chamber. Whirlpool chamber. Centrifugal pump with backward curved vanes. Losses. Volume discharged.

Efficiency of propellers. Jet propeller. Paddle-wheel. Screw.

Theory of Machines.

1. Kinematics of Machines.

Definition of a machine. The elementary pairs of a machine. The characteristics of the lower pairs. Sliding, turning (revolving and oscillating), and screw pairs. Closure, inversion, and velocity of a pair. Partial or complete locking of a pair (ratchets and keys).

The coupled pieces of a machine compared with the connected links of a chain and called a "kinematic chain." The fixed or frame link. Inversion of the chain by changing the fixed or frame link.

Important mechanisms consisting of four lower pairs. The mechanism of the direct acting engine, consisting of three turning and one sliding pair, called the slider-crank chain. Other mechanisms derived by inversion of the same chain. Determination and graphic representation of the relative positions of the elements and velocities of the pairs. Zeuner's valve diagram. Line of connection. Instantaneous axis of a link. Speed of piston. Effect of shortness of connecting rod.

Mechanisms consisting of two turning and two sliding pairs.

Mechanisms consisting of four turning pairs. Drag link coupling. Parallel cranks (locomotive coupling rod). Lever

and crank (Beam engine). Double lever (Watts' parallel motion). Proportion and most accurate setting of parts for rectilineal motion. Other derived rectilineal motions.

Screw chains.

Employment of higher pairs in machines. Non-rigid elements. Tension elements. Blocks and tackle. Relative velocities of rope and pulley. Wheel and axle. Weston's differential pulley. Belts, open and crossed. Stepped speed cones. Connection of shafts not in one plane. Compression elements. Hydraulic connection (Bramah's press).

Higher pairing with rigid elements. Rolling contact between wheels with cylindric and conical pitch surfaces. Frictional gearing. Nest gearing. Toothed gearing. Train of wheels. Inversion of train, rotation of arm of train (epicyclic gear). Sliding contact between rigid elements. Angular velocity ratio of rotating pieces. Reasons for special forms for the teeth of wheels. Definitions of terms. Involute teeth. Epicycloidal teeth; approximation by circular arcs. Pin teeth. Racks.

Cams.

2. Dynamics of Machines.

Estimation and graphical representation of energy exerted by a variable force, or work done against a variable resistance. Work of a couple. Power, the rate at which energy is exerted. Horse-power.

Principle of work as applied to machines working without friction, the forces acting on the machine being balanced; force ratio the inverse of the velocity ratio.

Unbalanced forces acting on a machine. Accumulation of kinetic energy. Estimation of kinetic energy in moving parts of a machine.

Variation of crank effort in single direct acting engine with uniform steam pressure. Crank effort of a pair of engines coupled. Crank effort with variable steam pressure. Fluctuation of energy. Periodic motion. Fluctuation of speed. Fly-wheels.

Effect of inertia of reciprocating parts of an engine. Balancing of a locomotive.

Friction of machines. Work expended in overcoming friction of lower pairs. Variation of co-efficient of friction. Efficiency of a machine: estimated exactly, estimated as the product of the efficiencies of the pairs composing it, or determined by assuming the loss by friction to be partly proportional to energy transmitted through machine and partly constant. Various statements of the relation between energy exerted and work done. Counter-efficiency. Reversibility of a machine.

Efficiencies of some of the higher pairs.

Governors. Dynamometers. Brakes.

Thermodynamics.

Measurement of temperature and quantities of heat. Relations between pressure, temperature, and volume of steam. Total heat of formation of steam.

External work done during evaporation. Relation between heat and work; Joule's equivalent. Internal work of evaporation.

Operation of a non-expansive working engine. Expenditure of heat and steam. Efficiency. Condensation water.

Calculation and graphical representation of the energy exerted by an expanding fluid. Relation between pressure and volume of expanding steam. Indicator diagram. Mean pressure.

Transmission of heat to and from metal of cylinder when steam is used expansively, and consequent limitation of economical ratio of expansion. Expenditure of heat and steam in expansive working engine. Efficiency. Advantage of steam jacket and superheating. Operation of compound engine. Indicator diagrams. Advantages of compound engine.

Efficiency of thermally perfect air engine. Reversibility. Carnot's principle. Maximum efficiency of any heat engine.

BRANCH III.—MATHEMATICS.

First and Second Years.

Full marks allotted - - - - - 800.
Marks to be gained for qualification - 200.

PURE MATHEMATICS.

Full marks allotted - - - - 400.

Mensuration.

As contained in any elementary manual.

Trigonometry.

Direction of measurement of straight lines or angles denoted by algebraic sign. Measurement of angles by degrees, and circular measure. Definition of the trigonometric ratios, and investigation of formulæ including all angles which have the same sine, cosine, or tangent; formulæ expressing the sine, cosine, or tangent of the sum or difference of two angles in terms of the trigonometric ratios of the single angles, and formulæ deduced from these. Construction of tables. Solution of triangles, determination of lengths of lines connected with the triangle. Adaptation of formulæ to logarithmic computation. Heights and distances.

Analytical Geometry.

Determination of a point by any two in dependent co-ordinates. Ordinary systems of rectilinear and polar co-ordinates. Equation of a curve. Locus of an equation. Equation of a straight line in various forms. Homogeneous equation of the second degree representing two straight lines through the origin, and equation of the two straight lines bisecting the angles between

them. Conditions of parallelism and perpendicularity. Transformation of co-ordinates. Circle, various forms of its equation, and of the equations of tangent and normal. Parabola, equation in the form of $y^2=4mx$. Equations of the tangent and normal in terms of their inclination to the axis. Ellipse, equation in various forms. Eccentric angle. Equation of chord, tangent, and normal in terms of eccentric angle. Conjugate diameters. Hyperbola (the only separate investigation needed is that of the properties of the asymptotes). Equation of a hyperbola referred to its asymptotes, and equations of chord and tangent.

Differential and Integral Calculus.

Definition of a differential coefficient. Differential coefficients of a sum, product, and quotient. Differential coefficients of simple functions. Successive differentiation. Taylor's theorem. Expansions of functions in series. Differentiation of a function of two variables. Differential coefficient of a function of functions, and of implicit functions. Change of independent variable or of two independent variables. Maxima and minima of functions of one and of two variables. Differential coefficients of an arc, area, volume, surface, &c. Determination of the centre and radius of the circle of curvature at any point of a curve.

Integration, a limiting form of summation. General, indefinite, and definite integrals. Integration of simple functions. Formulæ of reduction. Integration of rational fractions. Geometrical applications. Moments of inertia, centres of gravity.

APPLIED MATHEMATICS.

First and Second Years.

Full marks allotted - - - - 400.

Statics.

The composition and resolution of forces acting in one plane at a point. Conditions of equilibrium of a particle under the action of forces in one plane. Equilibrium of a particle on

plane curves, rough and smooth. Virtual work and work done by a force. Composition and resolution of forces acting in one plane on a body. Application of these conditions to examples, both in the case of smooth systems, and in that of rough systems acted on by forces in one plane. Equilibrium of the simple machines. Determination of the centre of mass (or centre of gravity) of a system. The principle of work, and diagrams of work done by varying forces. The common catenary. The catenary of uniform strength.

Kinematics.

Composition and resolution of velocities. Expressions for velocity as differential coefficients. Angular velocity. Relative motion of two moving points. Acceleration. Components of acceleration of a moving point along tangent and normal to its path. Pure rotation of a body. Instantaneous axis and instantaneous centre. Case of pure rolling. Case of slipping accompanied by rotation. Centrodes in the body and in fixed space.

Kinetics.

Motion of a single particle deduced from Newton's second axiom. Gravitation and absolute measures of force. Kinetic energy of a particle. Work. Motion of a particle on plane curves. Impact of smooth balls. Motion of projectiles.

Kinetics of all systems, deduced from Newton's third axiom. Motion of centre of mass. Motion round centre of mass. Energy of rigid-body motion. Energy of heat. Transformation of energy. Impulses. Blows. Compound pendulum. Ballistic pendulum. Centre of percussion. Rolling of spheres and cylinders down rough inclined planes.

Hydrostatics.

Density and specific gravity of a substance. Intensity of pressure at a point. Equality of pressure intensity in all directions round a point in a fluid.

Transmission of pressure. The hydraulic press.

Intensity of pressure at any point of a heavy homogeneous liquid. The free surface a horizontal plane.

Pascal's principle. The hydrostatic paradox.

Resultant pressure on any plane surface immersed in liquid.

Centre of pressure on a plane area; calculation of its position. Principle of Archimedes and general principle of buoyancy. Resultant, horizontal and vertical pressure on any surface in a liquid.

Conditions of equilibrium and stability of floating bodies.

Boyle and Gay-Lussac's laws for gases.

Determination of heights by barometer

Action of the siphon, the pump, the diving-bell, the hydraulic ram, the Sprengel and Geissler pumps.

Hydrometers.

Tension of flexible surfaces under fluid pressure.

Hydrokinetics.

Steady motion of a liquid under the action of gravity.

Bernoulli's equation. Calculation of efflux from vessels.

BRANCH IV.—NATURAL SCIENCE.

First and Second Years.

Full marks allotted, without 3rd year Laboratory -	760.
Ditto, with ditto - - - - - - - - -	860.
Marks to be gained for qualification, without ditto	253.
Ditto, with ditto - - - - - - - -	267.

CHEMISTRY.

Full marks allotted - - - - 160.

Relations between chemical and physical actions. Mechanical mixtures and chemical compounds. Conditions necessary for chemical action. Analysis of water, of hydrochloric acid, and of ammonia. Properties of their constituents. Their composition by volume and weight. Elementary and compound bodies. Analysis and composition of marsh gas. Atomic theory. Modes of determining the atomic weights of elements. Combination in multiple proportions. Atomicity of elements. Molecules, elementary and compound. Modes of chemical action. Direct combination. Displacement. Mutual exchange. Rearrangement. Decomposition. Chemical notation. Compound radicals.

Metals and non-metals.

Preparation and properties of the most important non-metallic elements. Hydrogen. Its occurrence in nature, preparation and

properties. Methods of manipulating with gases. Chlorine. Its occurrence, preparation and properties. Hydrochloric acid. Oxygen. Its occurrence, preparation and properties. Combustion. Ozone. Water. Its chemical and physical properties. Ice Steam. Ebullition. Corrections for temperature and pressure to be employed in the measurement of gases. Solution of gases and solids in water. Crystallization. Isomorphism. Dimorphism. Supersaturation. Freezing mixtures. Peroxide of hydrogen or hydroxyl. Oxides and acids of chlorine. Bleaching powder and its uses. Preparation of chlorates. Boron and its compounds. Manufacture of boric acid and borates. Carbon. Different varieties of carbon. Allotropy. Diamond; graphite; animal charcoal; wood charcoal; lamp black; their properties and uses. Compounds of carbon with oxygen. Carbonic anhydride. Its properties. Liquefaction of gases by pressure. Carbonic oxide. Nitrogen. Preparation and properties. Ammonia. Its preparation and properties. Theory of ammonium. Composition and constitution of ammoniacal salts. Compounds of nitrogen with chlorine and iodine. Compounds of nitrogen with oxygen and hydroxyl. Nitric acid. Manufacture and uses. Nitrification. The uses of nitre. Gunpowder. The atmosphere. Its physical and chemical properties. Combustion. Heat of combustion. Sulphur, its occurrence in nature and modes of purification. Properties of sulphur. Allotropic modifications of sulphur. Compounds of sulphur with hydrogen. Sulphuretted hydrogen. Its preparation, properties and uses. Compounds of sulphur with oxygen. Sulphurous anhydride. Sulphurous acid. Its application in bleaching. Sulphuric anhydride. Sulphuric acid. Its manufacture and applications. Coal gas. Bromine and its compounds. Iodine and its compounds. The compounds of fluorine. Silicon and its compounds. Phosphorus. Its occurrence, manufacture and uses. Allotropic varieties of phosphorus. Manufacture of lucifer matches. Compounds of phosphorus with hydrogen. Compounds of phosphorus with oxygen and hydroxyl. Phosphoric anhydride. Phosphoric acid. Metaphosphoric acid. Pyrophosphoric acid. Arsenic and its compounds. Compound of arsenic with hydrogen. Arsenious anhydride and acid. Detection of arsenic. Antimony and its compounds. Bismuth and its compounds.

Physical properties of metals. Opacity. Lustre. Conductivity for electricity. Conductivity for heat. Relations of the metals to heat. Fusibility. Volatility. Electrolysis. Combustibility of metals. Potassium, its preparation and properties. Manufacture and uses of potash. Disintegration of rocks. Salts of potassium. Sodium, its preparation and properties. Manufacture of common salt from brines. Manufacture of sodic carbonate. Lithium and its compounds. Rubidium, cæsium and thallium. Silver, its occurrence and extraction from its ores. Barium, strontium, calcium and their compounds. Natural waters and their impurities. Hardness of water and mode of softening. Boiler deposits. Mortar and cement. Magnesium and its compounds. Zinc, its occurrence, reduction from its ores, and uses. Galvanized iron. Zinc white. Cadmium and its compounds. Mercury, its extraction from its ores. Compounds of mercury and their uses. Copper, its occurrence and preparation. Alloys of copper. Brass, bronze, &c. Compounds of copper. Gold and its compounds. Tin and its compounds. Aluminium and its compounds. The manufacture of alum. Applications of aluminium compounds. Platinum and its uses. Lead, its occurrence and extraction from its minerals. Manufacture of white lead. Action of waters on lead. Manufacture of glass. Iron. Occurrence of iron in nature. Manufacture of cast iron, wrought iron and steel. Compounds of iron and their applications in the arts. Chromium and its compounds. Manganese and its compounds. Cobalt and its compounds. Nickel and its compounds. Alloys of nickel.

CHEMICAL LABORATORY.

First Year.

Full marks allotted - - - 100.

Qualitative analysis of simple salts.

Third Year.

Full marks allotted - - - - 100.

(Alternative with Architectural Design and Physical Laboratory.)

Quantitative analysis, Gravimetric, Volumetric, and Gas analysis.

PHYSICS.

Full marks allotted - - - - 160.

ELECTRICITY AND MAGNETISM.

Electrification by friction. Electroscopes. Electrification by induction. Measurement of electrical forces. Torsion balance. Law of force. Dissipation. Distribution in simple cases. Hollow bodies. Definition of potential. Lines and tubes of force and elementary properties. The condenser. Capacity of a plate-condenser. Specific inductive capacity. Electric energy. Phenomena of discharge. Plate machine. Electrophorus. Replenisher. Holtz and Voss machines. Attracted disc electrometers. Quadrant electroscope. Atmospheric electricity.

Properties of magnets. Induction. Magnetising. Compound magnets. Circumstances affecting strength of magnets. Distribution of magnetism. Magnetic field and lines of force. Magnetic curves. Laws of magnetic force. Methods of measurement. Diamagnetism. Terrestrial magnetism. Measurement of magnetic elements. Their variations.

Volta's experiments. Voltaic cell. Chemical actions in cell. Batteries, typical forms in common use. Magnetic actions. Galvanometers: astatic, differential, sine, tangent, reflecting. Electrolysis. Voltameters. Ohm's law and deductions from it.

Electrical testing, simple methods of determining electromotive force, resistance and current-strength. Practical units and their relation to the electro-magnetic units. Joule's law. Thermo-electricity, Peltier and Thomson effects, thermo-electric inversion. Electromagnets. Mutual actions between currents and currents, and between currents and magnets. Electrodynamometer. Induction. Lenz's law. Induction coil. Magneto-electric and dynamo-electric machines, Clarke, Gramme, and Siemens. Electromotors, secondary batteries. Transmission of power. The electric light. Elementary principles of telegraphy and telephony.

HEAT.

Definition of temperature and its measure. Expansion, linear and cubical of solids: Ramsden, Matthiessen, weight-thermometer. Expansion of liquids, U-tube method, dilatometer; case of water, Despretz, Joule. Expansion of gases, Regnault. Charles' law. Principles of thermometry. Temperature as measured by the expansion of solids, liquids or gases. Mercurial thermometer. Air thermometer. Thermometers for various purposes. Density of solids, liquids and gases.

Calorimetry. Specific heat of solids and liquids. Method of mixture, ice-calorimeters. Specific heat of gases at constant pressure, Wiedemann. Dulong and Petit's law. Change of state. Solid-liquid; latent heat, solution, supersaturation, regelation. Liquid-gas: evaporation and ebullition, pressure of saturated vapours (Regnault), non-saturated vapours, liquefaction of gases, latent heat. Density of vapour, steam. Hygrometry. Transmission of heat. Radiation: reflection, refraction, absorption, emission, heat and light. Conduction: simple cases of steady flow across a plate and along a bar. Convection.

Thermodynamics. First law. Mechanical equivalent of heat. Joules' determinations by stirring water and by compressing air.

Sources of heat.

LIGHT.

Photometry. Velocity of light. Reflection: plane and spherical mirrors. Refraction: plates, prisms, lenses. Dispersion, the spectrum. Achromatism. Optical Instruments. Colour.

Undulatory theory. Reflection and refraction. Interference, Young's experiment. Newton's rings. Double refraction and polarisation, elementary phenomena.

SOUND.

Wave-motion. Velocity of sound. Reflection and refraction. Resonance. Pitch. Intensity, interference, beats, quality, harmonics. Transverse vibrations of strings and plates. Organ pipe. The diatonic scale.

PHYSICAL LABORATORY.

Second Year.

Full marks allotted - - - - 100.

Accurate physical measurements of some of the more important constants in General Physics, Electricity, Heat, and Optics.

Third Year.

Full marks allotted - - - - 100.

(Alternative with Architectural Design or Chemical Laboratory.)

Extension of second year studies. Special work in one or more of the four branches of physics.

GEOLOGY AND MINERALOGY.

First and Second Years.

Full marks allotted to lecture course - -	**210.**
Geological work and excursions in first year -	**30.**

Course I.

DYNAMICAL GEOLOGY AND THE DESCRIPTION OF THE COMMON ROCK-MAKING MINERALS.

The connexion of geology, physical and descriptive geography. Definitions of these sciences: Hutton and Lyell's definitions of geology: the history of the changes in nature. The doctrine of uniformity, its limits in relation to the conservation of energy. The importance of the modern example. The position of the earth in the solar system, its movements; variation in the eccentricity of the orbit, and the influence on mean temperature. The discovery of the shape of the earth, its measurements. The density, rigidity, and internal pressure. G. Darwin's theory of stresses. Evidence of internal heat, theories of residual and of kinetic heat; secular cooling and its results. Work done in the globe during reversible dissipation of heat. Effects of contraction of rocks.

Primary and subsequent modifications of the surface of the spheroid, geanticlinals and geosynclinals. Present distribution of land and sea: contour of the land surface, mean height in relation to a datum line. Continents, ages of, details of a continental system, mountains, plateaux, low plains, valleys. Theory of the formation of a continent. Different kinds of mountain systems, ages of mountains. Synclinoria and anticlinoria. Upheaval of land and sea floor, subsidence and curving of strata. The ocean floor, relation to datum line, its contour—the Atlantic and Pacific areas. The sea, constituents, temperatures, currents, circulation, and pressure. The deposits on the floor of the great oceans, their comparison with ancient deposits. The biology of the deep sea:

the great groups of invertebrata, their connexion with the past. Littoral seas and their deposits, ripple-mark, raised beaches, coral islands, atolls, reefs; reef deposits, mud, oolite, changes in modern limestone, marine denudation, cliffs, foreshores.

The atmosphere, its physical and chemical properties in relation to geology. Temperature, pressure, movements, evaporation and condensation, rainfall. Rainless regions. Snow, snow line, nevé, glaciers, moraines, and physical effects on rocks. Former glaciers. Sea ice. Icebergs and floes. River valleys and rivers, details; geology of water supply and storeage: common springs, fissure and fault springs, Artesian systems. Denudation in river valleys. Oscillation, deposit and removal of gravels and loess, high and low level gravels and loess. Earth pillars. Caves and their contents. The fauna of the deposits; its reference to the age of man on the earth. Deltas. Lakes, wadys, deserts, Cañons. Tundras. Bogs.

Volcanoes, nature, shape, position, composition; kinds, eruptions; causation: extinct volcanoes. Earthquake. Geysers. Hot springs. Climate, isothermal lines, causes, former climates. Distribution of plants and animals: natural history provinces. Former distribution of provinces and the relation of the present to the past.

The description of the common rock-making minerals.

Course II.

Descriptive Geology, Petrology, and Palæontology.

Relation of old sedimentary rocks to recent deposits. The nature and principles of stratification, lamination and cleavage. Thinning out, false bedding; dip, strike, conformity, unconformity, overlap, outlier, inlier, anticlinals, synclinals, reversals, faults. Joints. Formations, series, equivalent strata, homotaxis, horizons. Relation of changes to time, consecutive physical geographies, formations, epochs, ages. Metamorphism, local and regional, volcanic phenomena and results during consecutive ages. Breaks, organic or biological, and physical. The imperfection of the record. Principles of geological surveying and map-making. The importance of fossils

— fossilization. Description of types of fossil foraminifera, spongida, corals, brachiopoda, and cephalopoda, and of the great divisions of the vertebrata. Carboniferous plantæ. The Archæan series of the United Kingdom, the Cambrian, Silurian, Devonian, Carboniferous, Permian, Secondary and Tertiary formations, with especial reference to economical operations, mining, &c. The main features of the geology of India. A description of the commonest igneous, metamorphic and sedimentary rocks.

ALTERNATIVE SUBJECTS NOT INCLUDED IN EITHER OF THE FOUR BRANCHES.

First Year.

Full Marks - - - - - - 80.

FREE-HAND DRAWING,

OR

THE FRENCH LANGUAGE,

OR

THE GERMAN LANGUAGE.

OPTIONAL COURSE.

BRANCH I.—ENGINEERING.

WORKSHOP PRACTICE.

First and Second Years.

Marks allotted - - - - 160.

A portion of the Student's leisure time during the first and second years may be spent in the workshop, which is well provided with engine-power, machine tools, dynamos, and all other necessary appliances. He will assist in the usual workshop processes employed in the construction of engineering and electrical machinery, and will receive marks, as above, in proportion to the quality and quantity of work done by him.

REPORTS.

Second Year.

Marks allotted - - - - 80.

Visits to works are occasionally made at prescribed times, and reports or notes upon them made, in proper form, are examined, and receive marks according to merit.

DESIGNS.

Third Year.

Marks allotted - - - - - 240.

The marks will be given for additional calculations and drawings in amplification of the obligatory designs in construction, hydraulic engineering, and architecture, to be specified from time to time when the subjects for those designs are notified; 80 marks for each. [*See* pp. 70–71.]

The architectural design may be omitted, and an advanced course in the Chemical or Physical Laboratory substituted; either carrying the same marks.

BRANCH II.—APPLIED MECHANICS.

Third Year.

Marks allotted - - - - - 300.

The more difficult portions of the syllabus on this subject (already given at pp. 73–89) will be reserved for study as part of the optional course, and separate instruction in them will be given to those students who are desirous of pursuing the subject beyond the obligatory course. The portions to be thus reserved will be notified from time to time.

BRANCH III.—MATHEMATICS.

PURE MATHEMATICS.

First and Second Years.

Marks allotted - - - - - 150.

Algebra.—Exponential and logarithmic series. The simpler tests of the convergency and divergency of series.

Trigonometry.—De Moivre's theorem. Series for sine and cosine in terms of the circular measure of the angle. Series for $\sin^n\theta$ and $\cos^n\theta$ in terms of the sines or cosines of multiples of θ. Series for $\sin n\theta$ and $\cos n\theta$ in terms of $\sin\theta$ or $\cos\theta$. Series for θ in terms of $\tan\theta$. Calculation of the numerical value of π. Series for θ in terms of $\sin\theta$. Separation of $\sin\theta$ and $\cos\theta$ into their factors. Interpretation of $a+b\sqrt{-1}$. Expression of different impossible quantities in the form of $a+b\sqrt{-1}$.

Analytical Geometry.—Equation of two tangents drawn to a conic from an external point. Relation of pole and polar. Envelope of a system of straight lines or curves, whose equation involves a parameter in the second degree. Polar equation of a conic referred to the focus; chord, and tangent. Conic represented by the general equation of the second degree; determination of its centre, excentricity, and methods of finding the foci and directrices. Invariants. Equation when the centre is origin. Equation referred to two tangents; condition for a parabola and equation of the tangent. Equa-

tion of the chord, tangent, and polar, in the case of the general equation; and equation of a pair of tangents.

Differential Calculus.—Maxima and minima of functions of n variables connected by $n-r$ equations. Tangent and normal to a plane curve. Asymptotes. Tests of concavity and convexity. Contact, order of contact, circle and other curves of curvature. Evolutes and involutes. Singular points of curves. Tracing of curves from their equations. Envelopes.

Differential Equations.—Equations of the first order and degree in two variables, exact differential equations, integrating factors.

Equations of the first order but not of the first degree. Clairaut's form, equations which can be solved by differentiation.

Singular solutions of equations of the first order.

Linear equations of an order higher than the first.

Simultaneous differential equations (linear and with constant coefficients).

Partial differential equations of the first order.

Special attention should be directed to such differential equations as have their application in physics.

Solid Geometry.—Determination of a point in space by any three independent co-ordinates. Rectilinear and polar co-ordinates. Projections of lines and areas. Direction cosines. Direction ratios. Equations of a straight line and plane in various forms. Condition of parallelism and perpendicularity. Distance from any point to a plane whose equation is given. Transformation of co-ordinates. Discriminating cubic. Conditions for equal roots. Equation of a quadric cone. Sphere, centres of similarity and radical planes. Generation and equation of an ellipsoid; of the hyperboloids of one and two sheets; of the elliptic and hyperbolic paraboloids. Circular sections of the ellipsoid, hyperboloids, and elliptic paraboloid. Generating straight lines of the hyperboloid of one sheet and hyperbolic paraboloid. Equations of tangent planes and tangent cones. Areas of plane sections.

APPLIED MATHEMATICS.

First and Second Years.

Marks allotted - - - - - - 150.

The subjects are the same as those in the obligatory course, the papers set in the optional being of a more advanced character than those in the obligatory.

BRANCH IV.—NATURAL SCIENCE.

Second and Third Years.

CHEMICAL LABORATORY.

Second Year.

Full marks allotted - - - - 80.

Qualitative analysis of mixtures.

Third Year.

Full marks allotted - - - - 80.

A course of quantitative analysis, alternative with the architectural design or physical laboratory.

PHYSICAL LABORATORY.

Third Year.

Full marks allotted - - - - 80.

Extension of the special study taken up in the obligatory course, alternative with the architectural design or chemical laboratory.

ALTERNATIVE SUBJECTS.

Second Year.

Full marks allotted - - - - 80.

FREE-HAND DRAWING,

OR

THE FRENCH LANGUAGE,

OR

THE GERMAN LANGUAGE,

IN EXTENSION OF THE OBLIGATORY COURSE.

OBLIGATORY COURSE

FOR

TELEGRAPH STUDENTS.

First Year.

Students for the Telegraph Department are nominated at the end of the first year from those who have completed that year's course for engineer students.

Second Year.

Part of the work is the same as that laid down for engineer students. The remainder consists of special subjects in connection with telegraphy, which, together with the marks awarded, appear in the table on the next page. The course ends with the second year, and all the subjects of study are obligatory.

TABLE OF SUBJECTS TO BE TAKEN UP BY TELEGRAPH STUDENTS IN THE SECOND YEAR, AND THE CORRESPONDING MARKS COLLECTED TOGETHER.

The arrangements notified in this table are liable to alteration from time to time.

Categories.	Subject.	Qualifying Minimum.	Maximum Obtainable.	
Branch I. Telegraph Engineering.	Accounts	—	70	
	Physics and Telegraphy	—	400	
	Telegraph Construction	—	100	
	Workshop	—	400	
	Mechanical Laboratory	—	50	
	Signalling	—	160	
	Total	$0{\cdot}4 \times 1180 = 472$		1180
Branch II. Applied Mechanics.	Construction	—	300	
	Total	$\frac{1}{4} \times 300 = 75$		300
Branch III. Mathematics.	Pure Mathematics	—	100	
	Applied Mathematics	—	200	
	Electricity and Magnetism	—	200	
	Total	$\frac{1}{4} \times 500 = 125$		5 0
Branch IV. Chemistry.	Chemical Laboratory	—	100	
	Total	$\frac{1}{3} \times 100 = 33$		100
	Visits to Works	. . .		80
	Drill and Gymnastics	. . .		20
	Total	. . .		2180

Qualifying minimum in the total of the second year's work, is $0{\cdot}5 \times 2180 = 1090$.

BRANCH I.—TELEGRAPH ENGINEERING.

Full Marks allotted - - - - 1180
Marks to be gained for Qualification - 472.

ACCOUNTS.

Full Marks allotted - - - - 70.

PHYSICS AND TELEGRAPHY.

Studied in the Physical Laboratory.

Full Marks allotted - - - - 400.

Calorimetry, melting points, hygrometry, the balance.
Charging and maintenance of batteries.
Battery tests.
Various methods of measuring resistances, E. M. F.'s, and currents.
Measurement of capacities.
Measurement of the heating effects of currents.
Determination of the strength of the earth's magnetic field.
Regular tests of lines. Testing an artificial line.
Testing for faults. Loop test. Capacity test.
Testing of lightning conductors.

TELEGRAPH CONSTRUCTION.

Full Marks Allotted - - - - 100.

Properties and Application of Materials.—Operations and Manipulation.

Wood, its properties and preservation. Carpentry. Masts.
Earthwork. Foundations.
Cementing materials, concrete, bèton, and asphalte.
Masonry and brickwork.
Cast iron, wrought iron, steel, malleable castings.
Copper, zinc, lead, tin, and alloys.
Insulating materials. Gutta-percha, india-rubber, porcelain, &c.
Lifting tackle, blocks and chains, &c.
Tools and mechanical manipulation.
Soldering, fluxes. Brazing.
Surveying, levelling and sounding, plotting surveys.

Telegraph Construction, Maintenance, and Organisation.

Construction of telegraph lines, general remarks on the designing.
Estimating the cost of erection.
Construction of land lines, submarine and river cables. Fittings and arrangements of offices.
Maintenance and organisation, repairs.

WORKSHOP.

Full Marks Allotted - - - - 400.

Use of tools. Uses and treatment of materials. Making models and parts of instruments and apparatus. Assembling, erecting, and finishing instruments and apparatus. Taking to pieces and repairing instruments and apparatus. Testing for faults in instruments. Adjustment and correction of faults. Erecting, adjusting, setting to work and repairing a short line of telegraph.

MECHANICAL LABORATORY.

Full Marks Allotted - - - - 50.

Practice in the use of testing machinery in determining the strength of materials.

SIGNALLING.

Full Marks Allotted - - - - 160.

Signalling by Morse ink-writers and by sounders.

BRANCH II.—APPLIED MECHANICS.

The subjects are the same as those in the syllabus for Engineer Students, with some modifications; but Mechanism, Hydraulics, and Dynamics of Machinery are omitted.

APPLIED MECHANICS (CONSTRUCTION).

This course continues throughout the Session, and is, with certain omissions, the same as for 2nd year Engineer Students, with the addition of certain portions of their 3rd year course.

Full Marks Allotted - - - 300.
Marks to be gained for Qualification - 75.

BRANCH III.—MATHEMATICS.

Full Marks allotted - - - - 500.
Marks to be gained for Qualification - 125.

PURE MATHEMATICS.

The course is the same as for Engineer Students during the first two terms.

Full Marks Allotted - - - - 100.

APPLIED MATHEMATICS.

This course is the same as for Engineer Students, so far as time permits.

Full Marks Allotted - - - - 200.

ELECTRICITY AND MAGNETISM.

Full Marks Allotted - - - - 200.

The C. G. S. system. Potential. Distribution of electricity on a conductor. Electrometers. Accumulators. Lines and tubes of force.

Strength of a magnetic pole. Magnetic field of a magnet. Mutual action of magnets. Calculation of terrestrial magnetism.

Strength of an electric current. Magnetic field of a current. Sine and tangent galvanometers. Ohm's law and Kirchhoff's corollaries. Shunts. Detection of the positions of faults in telegraph lines. Energy of a current. Electromotors. Electromagnetic induction. Calculation of electrolysis. Heating of conductors, &c.

[Text Books.—Silvanus Thompson's *Electricity and Magnetism*; Cumming's *Theory of Electricity*, Ganot's *Physics*, Everett's *Units and Physical Constants*, Latimer Clark's *Electrical Measurement*.]

BRANCH IV.

CHEMICAL LABORATORY.

Full Marks Allotted - - - - 100.
Marks to be gained for Qualification - 33.

VISITS TO WORKS.

Full Marks Allotted - - - 80

COURSES OF STUDY

FOR

FOREST STUDENTS.

Candidates for the Indian Forest Department are nominated annually by the Secretary of State for India in Council, on the results of a competitive examination held by the Civil Service Commissioners, according to the annexed Prospectus. These candidates enter the College as Students at the commencement of the session in September under the same general regulations as those which apply to Engineer Students. A part of their work is the same as that laid down for Engineer Students; the remainder consists of special subjects connected with Forestry.

During the course of study at the College, various forests in Great Britain and on the continent of Europe are visited for the purpose of demonstration and practical work. The expenses of these visits are defrayed by the Secretary of State in Council, in the manner set forth in the appended Prospectus.

Private Students are admitted to the Forestry Course, in so far as the available space admits, under conditions similar to those applying to the candidates for the Indian Forest Department.

REGULATIONS

FOR THE

FOREST SERVICE BRANCH OF THE ROYAL INDIAN ENGINEERING COLLEGE, COOPERS HILL, AS ISSUED IN 1894 FOR THE EXAMINATION OF JUNE 1895.*

[*The arrangements hereinafter described are subject to revision under the orders of the Secretary of State for India.*]

1. The Royal Indian Engineering College is primarily maintained, under the orders of the Secretary of State for India in

* The Regulations of 1894 for the Examination of June 1895 will be issued during the autumn of 1894.

Council, for the education of candidates for the service of Government in the India Public Works, Telegraph, and Forest Departments; but it is open, to the extent of the accommodation available, to all persons desirous of following the course of study pursued in it.

Indian Forest Department Appointments.

2. The Examination usually takes place towards the end of June; and candidates may undergo the written part of their examination in London, Edinburgh, or Dublin, or at any of the provincial centres at which the simultaneous examination of candidates for admission to the Royal Military College, Sandhurst, is to be held. A list of the probable centres may be obtained from the Civil Service Commissioners at any time after March 1895. The oral and practical parts of the examination will be held in London only.

3. The number of candidates to be selected annually varies according to the requirements of the Forest Service in India: the figures as regards each particular year will be advertised from time to time. *In* 1895 *there will be* 6 *appointments offered for competition.* It is possible that after 1895 recruits for the Indian Forest Service will be selected from Coopers Hill College students at the end of their first year's course of study.

4. Candidates for the Indian Forest Department are selected under the following arrangements:—

(*a*) An applicant must be a natural-born British subject, and must be above 17 and under 20 years of age on the 1st June of the year in which he competes for an appointment. He must be unmarried, and if he marries before reaching India he will forfeit his appointment.

(*b*) An applicant must send* to the Revenue Department of the India Office, on or before the 15th day of May of the year in which he proposes to compete:—

(1) His name and parentage, a certificate or other satisfactory evidence of the date of his birth,

* There is no form of application; the documents specified in Clauses (1) and (2) should be enclosed in a covering letter addressed to the Secretary, Revenue Department, India Office, London.

and the written consent of parent or guardian that his name should be recorded as a candidate.

(2) A statement of the places of education at which he may have been, accompanied by testimonials of good conduct during the last four years.

(*c*) Applicants will have to appear before a Medical Board* at the India Office, particular stress being laid upon good vision and hearing. A physical test will also be imposed, so as to ensure the selection of persons of active habits and powers of endurance.

(*d*) The applicants who have successfully passed the medical examination and the physical test will be required to undergo an examination before the Civil Service Commissioners† in the following subjects (Classes I. to III.), marks being assigned as follows:—‡

* With a view to prevent parents and guardians from incurring the inconvenience and expense of preparing candidates who may be physically unfit for the Forest Service, it is suggested that, before any such preparation is begun, candidates be submitted to examination by the medical adviser of the family, or any other qualified medical practitioner, with regard to the following points:—

1. A weak constitution.
2. Defective vision.
3. Impaired hearing.
4. The existence of any congenital defect.

It is to be understood that this private examination is merely suggested to lessen the chances of disappointment, and that it is by no means intended to take the place of, or to influence in any way, the official examination.

On the subject of the standard of eye-sight required for the Indian services, a pamphlet has been published, under the authority of the Secretary of State in Council, by Messrs. Churchill and Sons, 11, New Burlington Street.

† A fee of £2 is required from candidates at the written examination in London, and 3*l*. from candidates examined elsewhere. Candidates examined at a college or school will probably be required to pay a local fee (in order to defray the expenses of superintendence), as to which they should obtain early information from the college or school authorities. The fee payable to the Civil Service Commissioners must be paid by means of stamps of the specified amount. Instructions on this point will be issued to candidates about ten days before the examination.

‡ Reprints of the papers set at previous examinations, together with the marks awarded, are published by the Civil Service Commissioners, and can be had through any bookseller, at the price of one shilling.

CLASS I.—OBLIGATORY SUBJECTS.*

	Marks.	
1. Mathematics (lower), viz. Algebra up to and including the Binomial Theorem; the theory and the use of logarithms; Euclid, Books I. to IV. and VI.; Plane Trigonometry up to and including the solution of Triangles and Mensuration	2,500	In each of these subjects a candidate must obtain not less than one-third of full marks in order to qualify.
2. English composition . . .	1,000	
3. German (400 for colloquial) . .	2,000	

CLASS II.—OPTIONAL SUBJECTS.*

4. Mathematics (higher), including Analytical Geometry, Conic Sections, Statics, and Dynamics .	2,000	A candidate may take any two, but not more than two, of the optional subjects. Under "Optional Subjects" Nos. 9, 10, 11 and 12, the examination will be partly practical.
5. French (400 for colloquial) . .	2,000	
6. Latin	2,000	
7. Greek	2,000	
8. English History. There will be set: one general paper; one paper limited to a fixed period, which will be from the year 1760 to the year 1815 for the examination of 1895 .	2,000	
9. Botany, viz. the elementary parts of vegetable morphology, histology, and physiology, and the principles of a natural system of classification as illustrated by the more important British natural orders. Candidates will be required to describe plants in technical language. Questions will not be set on vegetable palæontology or on the geographical distribution of plants	2,000	
10. Chemistry, viz. the elements of Inorganic Chemistry . . .	2,000	
11. Physics. Elementary properties of Electricity, Magnetism, Heat, Light, and Sound . . .	2,000	

* Attention is invited to the appended Syllabus, giving further details regarding the extent and character of the examination (page 127).

12. Physical Geography and Geology, chiefly economic; including the recognition of the more familiar minerals and rocks, and their properties and uses . . .	2,000	
CLASS III.—ADDITIONAL SUBJECTS.		Either or both of these subjects may be taken in addition to the obligatory and the two optional subjects.
13. Freehand Drawing . . .	500	
14. Geometrical Drawing . . .	300	

(*e*) From the competitors who attain the above-mentioned minima of marks in obligatory subjects, and satisfy the requisite conditions in other respects, the Secretary of State will select candidades in order of merit as probationers to enter the College, where they will be further trained for the Forest Service of India.

(*f*) If the full number of competent probationers required in any year cannot be obtained from the persons so examined, the Secretary of State reserves a discretion to fill up the deficiency by selecting any other person or persons who may satisfy the authorities of the College that he or they are properly qualified to become probationers for the Forest Service.

5. The course of study for candidates for the India Forest Service extends over about 3 years, divided into 7 terms, and a period of study in foreign forests. During seven terms the candidates will prosecute their studies mainly at the College, and during the period of foreign study, which may last for 5 or 6 months, they will visit, under suitable supervision, such Continental forests as may be selected for the purpose. Excursions may also be made for purposes of instruction, both during term time and during part of the vacations.

6. Each annual session begins in September, and is divided into three terms, with vacations of about four weeks at Christmas, two weeks at Easter, and eight weeks in the summer, except at the end of the visit to the Continent, when the vacation will be shorter.

7. A charge of £61 is made for each of the seven terms spent at the College; for the period of foreign study the charge is £150

for each student; the amounts must be paid terminally, in advance, to the Bank of England for the first seven terms, and the amount due for the period of foreign study must be paid before the period begins. Receivable orders, with full directions as to the mode of payment, will be forwarded from the India Office to the parents or guardians, shortly before the fees fall due. A student will not be allowed to come into residence or to start for his foreign study of forests until his fee has been paid.

8. A deposit of £5 is required to be paid by each student on admission to the College, as caution money, to cover charges incurred by him for damage to books, instruments, &c., or any College bills outstanding on leaving the College. Any balance over and above such charges will be repaid. This deposit is to be paid with the fee for the first term, making the total payment on that occasion £66.

9. The foregoing payments cover all charges for tuition, board according to the College tariff, lodging, with washing up to the cost of 2*s.* a week, and ordinary medical attendance while in residence at the College. When students are on tour and during the course of practical instruction, whether in Great Britain or on the Continent, the Secretary of State will defray the expenses of (1) board, lodging, and washing (the maximum expenditure on such account being 10s. per diem), (2) travelling expenses, and (3) fees to local Forest officers, &c.

Students are required to provide their own class books and drawing instruments. Drawing paper, drawing boards, and surveying instruments, are provided by the College.

10. The prescribed course of study at present comprises the subjects enumerated in the Table of Marks on page 130.

11. Every student is required to conform to the College rules, to exhibit due diligence in his studies throughout the course, and to give evidence of satisfactory progress in such manner as may be required, failing which, or in the event of serious misconduct, he will be liable to be removed from the College, or to be sent back from the foreign study, which may entail the loss of his appointment.

12. During the course of study, the proficiency of the students will be tested by periodical examinations, and on the termination of their studies there will be a final examination. Each student

may also, at the discretion of the Secretary of State for India, be required to appear before the Medical Board at the expiration of the first year of residence at the College, and should the result be unsatisfactory he cannot claim to be allowed to complete the course.

13. The subjects of study are grouped in certain main categories,* and a fixed minimum of qualification is required in each category, and in the subjects taught during the forest tours, as well as a certain minimum for all categories taken together. Students who obtain these minima will receive the College diploma in forestry.

14. Candidates who have obtained this diploma, and are found to be of sound constitution and free from physical defects which would render them unsuitable for employment in the Forest Department (the final decision on which points will rest with the Secretary of State for India), will be appointed Assistant Conservators in the Forest Department of India in the order of their standing at the end of the final examination. They will be allowed before leaving the College to state their preference in respect to the provinces to which they desire to be allotted; but the distribution will be made at the discretion of the Secretary of State, after consulting the President of the College and the principal Professor of Forestry, to the several provinces according to the needs of the public service. The postings will be made according to the available vacancies in the different provinces, and on the understanding that officers are at all times liable to be transferred from one province to another at the pleasure of the Government of India.

15. Forest students, not exceeding two in number in any one year, who pass out of the College with special distinction, may be appointed "Honorary Fellows of Coopers Hill."

16. Within a month of his nomination as Assistant Conservator, each nominee must sign articles of agreement describing the terms and conditions of his appointment; he must embark for India when required to do so by the Secretary of State, and will be provided with a free passage. Failure to embark at the stated time will, in the absence of satisfactory explanation, lead to forfeiture of appointment.

17. The pay of an Assistant Conservator of Forests will begin

* For particulars of the categories of subjects, see p. 130.

from the date of arrival in India. Probationers who acquit themselves creditably during their course at Coopers Hill College will begin on a salary of Rs. 350 a month. It will, however, rest with the President of the College, in consultation with the Principal Professor of Forestry, to decide whether any of the probationers, though they have obtained the College diploma in Forestry, have failed to deserve that rate of initial salary. Such probationers, if any, will begin on a salary of Rs. 250 a month; and this difference of salary will continue until the first Departmental Examination is passed in India.

18. Promotion, leave, and pension will be regulated by the rules of the Service for the time being. The more favourable pension rules have recently been extended to Forest officers appointed from England, who are thus placed on an equality with Public Works officers appointed from Coopers Hill College. Any Forest officer, who has rendered not less than three years' approved service as head of his department, has also been made eligible for an extra pension of Rs. 1,000 per annum. A copy of the Regulations relative to these matters can be seen on application either at the Library or the Record Department of the Indian Office; the principal rules, however, are contained in the Abstract of the Civil Service Regulations, as given in the "India Office List" or the "India List," published respectively by Messrs. Harrison & Sons, 59, Pall Mall, and Messrs. W. H. Allen & Co., 13, Waterloo Place, S.W., either of which can be procured through any bookseller.

19. Every candidate, before proceeding to India, will be required to furnish to the President of the College satisfactory evidence of his competency in riding.

General Rules.

20. Chemical, physical, and botanical laboratories, a forestry museum, a forest nursery, a library, and gymnasium are attached to the College. Means are also provided for the practice of photography. Students making use of the laboratories are supplied with the needful apparatus.

21. The responsibility for the discipline and management of the College and for the superintendence of the studies is vested in the President, under the control of the Secretary of State for India.

22. The students are distributed in divisions, under personal charge of one of the Professors or Instructors selected by the President; such tutor being responsible for exercising the proper degree of personal supervision over each student in his division, and for conducting necessary correspondence with the students' parents or guardians.

23. Each student residing in the College is provided with a separate room, and with fuel and light, also with the necessary attendance. Furniture and bedding are supplied by the College, but each student is required to provide his own towels and bed linen. Meals are taken in hall. Wine and beer are not included in the ordinary fare, but can be obtained from the College cellar at fixed prices.

24. A chapel is attached to the College, which the students residing in the College are expected to attend, unless specially exempted.

25. Every student will be required to go through a course of gymnastics, and also of military exercises, including the use of the rifle.

26. Students are required to wear academical dress, under such regulations as may be prescribed from time to time.

Students not nominated for the Indian Forest Service, but desirous of obtaining a Diploma in Forestry from Coopers Hill College.

27. Students not nominated for the Indian Forest Service may be received into the College, as far as the available accommodation permits. Such students may pass through the course of instruction prescribed for the nominees of the Indian Forest Service, as detailed above, or they may be permitted to participate in the instruction given in certain subjects only. On attaining the prescribed minima of marks in the several branches of study and in totals as laid down above, they will receive, as the case may require, either the College Diploma in Forestry, or special certificates showing in what subjects they have followed the instruction, and with what result.

28. Candidates who desire to be admitted under para. 27 may submit the necessary application at any time, but not later than the 15th day of June of the year named for admission, except with the special permission of the President. The application must be made on the prescribed forms, which can be obtained from the Secretary of the College.

29. Candidates whose applications are found satisfactory as to character and in other respects will be required to undergo an examination, to be held at the College, about the last week in June of the year for admission. The object of the examination will be to ascertain whether the candidate is qualified to follow the course of instruction with advantage (or certain parts of it, as the case may be). Candidates who do not come up to the required standard will not be admitted to the College.

The President may dispense with the whole or any portion of this examination in the case of a candidate who produces an University diploma, or other similar certificate granted by a recognized examining body.

30. Candidates admitted to the College under para. 27, who propose to pass through the full prescribed course of study, will be required to pay the same fees in every respect as those paid by the nominees for the Indian Forest Service. Candidates who do not become resident, and are admitted only to certain subjects of study, will be required to pay the fees which may be fixed in each special case in consideration of the extent of their studies. The candidates of both classes will be required to abide by the general rules of the College.

FOREST ENTRANCE EXAMINATION.

SYLLABUS,

CLASS I.

Mathematics.—The extent of the Examination will be as follows:—

(*a*) Algebra, up to and including the binomial theorem, the theory and use of logarithms;

(*b*) Euclid, Books I. to IV. and VI.;

(*c*) Plane Trigonometry up to and including solution of triangles and mensuration.

English Composition.—The standard of positive merit will be looked for in logical arrangement of thought, and in accuracy and propriety of expression, but large deductions of marks will be made for faults of writing and spelling.

Candidates are also warned that, for similar faults in the use of the English language, similar deductions will be made from the marks obtained in the German papers in Class I.

German.—There will be translations of unseen passages from German into English, and from English into German; the passages for translation will be taken, mainly, from standard authors, and a few simple questions may be asked on the passages set, as to the structure and character of the language, and allusions of obvious and general interest. The *vivâ voce* Examination will include Dictation.

CLASS II.

Any two Subjects may be taken up.

Higher Mathematics.—

*** In all the following subjects great importance will be attached to accuracy in numerical results.

Further questions and problems on the subjects of the Examination in Mathematics, Class I.

And in addition:—

Statics: The equilibrium of forces acting in one plane and of parallel forces, the centre of gravity, the mechanical powers, and friction. (The graphical or geometrical method of treating such problems should be studied as well as the analytical. No application of the differential calculus to Statics will be required.)

Dynamics: Uniform, uniformly accelerated, and uniform circular motion, falling bodies and projectiles *in vacuo*, collisions and work. (Analytical methods of solution, but not the use of the differential calculus, will be involved.)

Analytical Geometry: Problems on straight line and circle.

Conic Sections: Elementary properties, with easy problems both on the analytical and geometrical methods.

French.—The passages for translation will be taken mainly from standard authors, and in other respects the Examination will proceed on the same lines as in German.

Latin.—Passages selected from the authors usually read in schools will be set for translation into English. Passages from English authors will be given for translation into Latin prose and verse, but Candidates will be allowed, in the place of verse composition, to

answer questions of a simple character, which will test whether they possess a fundamental knowledge of the grammar of the language, and such an elementary acquaintance with Roman History as is required for the intelligent study of the books they have read.

Greek.—Passages will be set for translation into English from the authors usually read in schools, and in other respects the Examination will proceed on the same lines as in Latin.

English History.—The General Paper in this subject will test whether the candidates are actually acquainted with the facts of English History, and also possess an intelligent knowledge of the meaning of the facts. The paper on the fixed period will, of course, require from the candidates more minute knowledge than the General Paper.

Botany, Chemistry, Physics, Physical Geography and Geology.—The standard of Examination in these subjects will be such as may be reasonably expected from the education given at schools possessing appliances for practical instruction, such as a laboratory, &c. A considerable portion of the marks will be allotted for the proficiency shown in the practical part of the examination.

Chemistry will be limited to elements of inorganic chemistry.

Physics will include elementary properties of electricity, magnetism, heat, light, and sound.

Geology, chiefly economic, including the recognition of the more familiar minerals and rocks, and their properties and uses.

CLASS III.

Both subjects may be taken up.

Drawing, Freehand.
Drawing, Geometrical.

GENERAL.

Handwriting.—In estimating the papers of candidates, a limited number of marks, namely 100 out of the maximum allotted to each subject, is assigned for handwriting.

TABLE OF MARKS, FOREST BRANCH.

N.B.—The arrangements notified in this table are liable to alteration from time to time.

Subjects.	Maximum Obtainable.	Total of Groups. Qualifying Minimum.	Remarks.
I.—Auxiliary Subjects.			
Geometrical Drawing	200	——	I. Year (two terms).
Free-hand Drawing	180	——	I. and II. Years.
Surveying	360	——	I. and II. Years.
Forest Engineering	190	——	III. Year.
Accounts	70	——	III. Year.
German	200	——	I., II., and III. Years.
		$1200 \times 0{\cdot}4 = \mathbf{480}$	
Applied Mathematics	160	——	I. Year (two terms).
Physics	260	——	I. and II. Years.
Inorganic Chemistry	260	——	I. Year.
Chemistry of Soils and Vegetation	220	——	II. Year.
		$900 \times 0{\cdot}33 = \mathbf{297}$	
Geology and Mineralogy	240	——	I. and II. Years.
Entomology	220	——	II. Year.
Botany	860	——	I., II., and III. Years.
		$1320 \times 0{\cdot}4 = \mathbf{528}$	
Drill and Gymnastics	100	100	I., II., and III. Years.
Total Auxiliary Subjects	—	$3520 \times 0{\cdot}4 = \mathbf{1408}$	
II.—Forestry.			
Sylviculture	500	——	I. Year.
Forest Protection	250	——	II. Year.
Forest Utilisation	250	——	III. Year.
Forest Management	600	——	II. and III. Years.
Forest Administration, with special reference to India	200	——	III. Year.
Forest Law and Land Tenure of India	200	——	III. Year.
		$2000 \times 0{\cdot}4 = \mathbf{800}$	
Practical Course of Forestry	1200	——	
		$1200 \times 0{\cdot}4 = \mathbf{480}$	
Total Forestry	—	$3200 \times 0{\cdot}4 = \mathbf{1280}$	
Grand Total	6720	$6720 \times 0{\cdot}4 = \mathbf{268}$	

N.B.—The proficiency of the Students will be tested by periodical examinations; and on the conclusion of their studies at the College there will be a final examination in Forestry, in which Students must obtain 40 per cent. of the marks allotted to it to qualify for the diploma in Forestry.

SPECIAL SUBJECTS OF STUDY IN THE FOREST BRANCH OF THE COLLEGE.

I.—SPECIAL AUXILIARY SUBJECTS.

CHEMISTRY OF SOILS AND VEGETATION.

Second Year.

Full marks allotted - - - - 150.

Soils, their Constituents, Constitution, Origin and Formation; Classification and Properties; Physical and Chemical Examination and Analysis of Soils; Exhaustion and Restoration of Soils.

Carbohydrates, including Cellulose, Lignin, Starch, Dextrin, Gum, Cane-sugar, Glucose, Glucosides, Mannite and other Sugars.

Organic Acids, such as Acetic and Butyric and the fatty acids; oils, fats, and waxes; glycerides. Oxalic, Citric, Tartaric, Malic, Benzoic and Salicylic acids.

Organic Bases, including Quinine and the chief Chinchona alkaloids; Morphine and the chief Opium alkaloids.

Turpentine and allied bodies; essential oils; Camphor; Resins; Benzine and Phenol.

Colouring matters, such as Chlorophyll, Indigo, Alizarin, and Purpurin; Phlobaphenes.

Proteids or Albuminoids; Peptones.

CHEMICAL LABORATORY.

Second Year.

Full marks allotted - - - - 70.

ENTOMOLOGY, INCLUDING ENTOMOLOGICAL LABORATORY.

First and Second Years.

Full marks allotted - - - - - 220.

The course commences with a short account of animal biology which comprises the following types, Amœba, Vorticella, Hydra, and Lumbricus. These serve to illustrate the nature of cells, and their nuclei, and the various tissues built up by them. The nature of the body cavity, &c., and the various systems of organs and their respective functions are described.

The Entomology proper commences with a detailed study of a typical Insect—Blatta—and its mode of life; special stress being laid on those points which are useful in classification, and the phases of the life history of the Insect.

The orders of insects are dealt with in the following sequence. I. *Orthoptera*, O. genuina, Cursoria, Gressoria. Mantis and Phasma—Mimicry—Saltatoria, locust-swarms and methods of combating them. O. pseudo-neuroptera, Cirrodentia, Termites, Amphibiotica. Incomplete metamorphosis.

II. *Neuroptera*. Plannipenia Ant-lions, Trichoptera, Strepsiptera. Parasitism.

III. *Lepidoptera*. Microlepidoptera, Macrolepidoptera, Geometridæ, Nocturnæ, Bombycinæ, Sphingidæ, Rhopalocera. Complete metamorphosis.

IV. *Coleoptera*. Pentamera, Heteromera, Pseudotetarmera, Pseudotrimera.

V. *Hemiptera*. Heteroptera, Hydrocores, Geocores, Homoptera Cicadaria, Phytophtheres, Aphidæ, parthenogensis Coccidæ.

VI. Diptera. D. genuina, Tipulariæ, Culicidæ, Cecidomyiidæ, Oestridæ, Muscidæ, Tachinidæ, D. pupipara, D. aphaniptera.

VII. Hymenoptera. H. phytophaga, Tenthredinidæ, Uroceridæ, H. entomophaga, Ichneumonidæ, Chalcididæ, Cynipidæ—galls—H. aculeata, Formicariæ, Vespariæ, Apiariæ.

The types of the various families of Insects are chosen as much as possible from those which are of forest importance, whether injurious or beneficial, and the methods of dealing with insect pests are dwelt upon.

BOTANY.

Full marks allotted - - - - 860.

BIOLOGY.

First Year.

Full marks allotted - - - - 80.

This part comprises the study of the elementary biology and classification of plants, and studies of special types, such as—

Protococcus, Spirogyra, Vaucheria, Œdogonium, Bacillus, Physarum, Saccharomyces, Pythium, Mucor, Erysiphe, Peziza, Parmelia, Agaricus, Puccinia.

The structure and life-history of Funaria.

The morphology and principles of classification of the vascular cryptogams, as exemplified by Aspidium, Pteris, Salvinia, Equisetum, Selaginella, Lycopodium.

The general biology of the phanerogams, with special studies of Pinus, Maize, Sunflower, Lime.

The students will commence the use of the microscope during this term, and their attention will be directed to the chief trees and shrubs (including conifers) of the neighbourhood.

ORGANOGRAPHY AND ANATOMY.

First Year.

Full marks allotted - - - - 80.

Organography and anatomy of the phanerogams, with special reference to trees and shrubs. The lectures embrace—

Descriptions of organs; typical roots, modified and degenerated roots, roots of parasites, structure and relations of roots.

Typical shoots, modified shoots, climbing stems, tendrils, thorns, runners, tubers.

Buds, bulbs, other modifications.

Leaves: their general structure and relations.

Cellular structure, protoplasm, nucleus, cell-sap, cell-wall, cell-contents, development of cells, division of cells, growth of cells.

Forms and systems of tissues, epidermis, vascular bundles, fundamental tissue and its modifications, mechanical tissues. Wood, cambium, bast, cork, bark, heart-wood and sap-wood. Growth in thickness of stems and roots, trunks and branches of trees. Timber, its formation, increment, properties, &c. &c.

Secretions: salts of lime and other inorganic bodies, resins, gums, oils, other secretions.

The students are to be shown several of the more important structures, but the detailed study of histology in the laboratory is deferred until their second year.

SYSTEMATIC BOTANY.

First and Second Years.

Full marks allotted (including marks for herbarium) - - 220.

This part deals exclusively with the practical study of systematic botany in the fields and in class. The students are taught to recognize and name the trees and shrubs and the principal herbaceous plants of the district, and are taught their systematic relationships. They are exercised in the use of the British Flora, and in the technical description of plants. The chief plants of India and Burmah are dealt with in the lectures, and specimens growing at Kew shown to the students.

BOTANY—PHYSIOLOGY.

Third Year.

Full marks allotted - - - - 160.

The physiology of plants. External conditions affecting plant-life. Properties of plants. Nutrition. Respiration. Ascent of water. Transpiration. Specific properties of wood. Absorption of water and dissolved substances by roots. Root-hairs and their relations to the soil. Root-pressure. Bleeding of cut stems, &c. Artificial nutrition of plants. Water-culture. The ashes of plants. Sources of the constituents of plants. Assimilation. Chlorophyll and light. Starch, its formation, changes, &c. Chemical changes of substances in plants. Metabolism. Carbohydrates. Fatty substances. Proteids. Ferments. Other substances and their relations in metabolism. Parasites. Saprophytes. Carnivorous plants.

During this term the students in the laboratory are to be exercised in more detailed work in the structure of plants, particularly the structure of wood and the cell-contents.

Physiology of the Growth and Reproduction of Plants.

In this course the students are instructed in the details of germination and the development of young organs; the influence of internal and external factors in promoting or retarding the development of stems, branches, roots, &c.; the effects of light, heat, moisture, gravitation, &c., on growth; the effects of pressures and strains on the development and growth of wood, cortex, &c.

Cross fertilisation. The relations between insects and flowers. Hybridisation. Sterility of seeds.

The laboratory work is a continuation of that of the previous term.

BOTANY—PATHOLOGY.

Third Year.

Full marks allotted - - - - 80.

Pathology. The Diseases of Plants.

In this course the students have described to them the chief diseases to which trees and timber are subject; so far as is possible they are shown specimens of the diseases.

Disease. The connection between normal and abnormal physiology. Causes and investigation of disease.

Injuries due to higher parasites. Mistletoe. Loranthus. Cuscuta. Orobanche. Other phanerogamous parasites. Epiphytes. Weeds.

Epiphytic and saprophytic fungi. Parasitic fungi.

The chief diseases due to fungi. Killing of seedlings by pythium. Phytophthora, and the destruction of beech and other seedlings. Diseases caused by Ustilagineæ. Uredineæ, and the damage they do to conifers and other trees. Wound-parasites, Hymenomycetes, and the destruction of timber. Dry-rot. Erysipheæ and mildews on leaves. Pyrenomycetes, and the destruction of oak seedlings by Rosellinia. Other diseases due to pyrenomycetes. Parasitic discomycetes. Peziza and the larch-disease. Other parasitic diseases.

Wounds. Healing by cork. Occlusion. Excretions of resin, turpentine, &c. Burrs and adventitious buds, &c.

Diseased conditions caused by abnormal states in soil, &c. Their explanation and treatment dependent on knowledge of physiology. Dying off of twigs. Stagnation of air and water in soil. The rotting of roots. Poisons. Action of frost. Intense insolation. Smoke and acid-gases in air. Lightning. Other injurious factors.

BOTANICAL LABORATORY.

First, Second, and Third Years.

Full marks allotted - - - 240.

FORESTRY.

Full marks allotted - - - -	2000.
Marks to be gained for qualification -	800.
ADDITIONAL—	
Full marks allotted to Practical Course -	1200.
Marks to be gained for qualification -	480.

SYLVICULTURE.

First and Second Years.

Full marks allotted - - - - 300.

The principal subjects dealt with are—

Soil. Climate. Effect of soil on tree-growth, and *vice versâ*. General principles upon which the formation of woods must be based. Description, from a sylvicultural point of view, of the more important species of forest trees. Pure and mixed woods. The sylvicultural systems. The creation and regeneration of woods by natural and artificial means. The tending of growing woods. Thinning and pruning.

PRACTICAL SYLVICULTURE.

First and Second Years.

Full marks allotted - - - 200.

FOREST PROTECTION.

Third Year.

Full marks allotted - - - - 250.

This part deals with the protection of forests against man; animals, especially insects; plants, especially noxious growth and fungi; climatic influences; natural phenomena, &c. The protection is afforded partly by laws passed by the legislature of the country, and partly by the owner of the forests.

FOREST UTILIZATION.

Third Year.

Full marks allotted - - - - 250.

The technical qualities of wood. Consumption of wood. Felling and shaping of trees. Disposal of wood. Transport of wood. Minor forest produce, such as litter, grass, fruits, bark, turpentine, caoutchouc, dyes, fibres, peat, &c. Impregnation of wood. Forest saw mills. Manufacture of charcoal.

FOREST MANAGEMENT.

Second and Third Years.

Full marks allotted - - - 400.

The normal state of forests. How to lead abnormal forests over into normal forests. Reserves. Arrangement of cuttings.

Division, survey, and mapping of forests. Selection of species, system, and rotation. Measurement of single trees and whole woods. Determination of the age of trees and woods. Determination of the increment of trees and woods. Yield tables. Classification of the quality of the locality. Description of locality and growing stock. The methods of regulating the yield of forests. Preparation of general and annual working plans.

FOREST MANAGEMENT, WORKING PLANS—PRACTICAL.

Third Year.

Full marks allotted - - - - 200.

Preparation of working plans.

FOREST ADMINISTRATION, WITH SPECIAL REFERENCE TO INDIA.

Third Year.

Full marks allotted - - - - 200.

FOREST LAW AND LAND TENURE OF INDIA.

Third Year.

Full marks allotted - - - - 200.

FIRST SESSION.

CLASS LISTS, JULY 1872.

FIRST YEAR STUDENTS.

[In all cases of equality the names are bracketed.]

BRANCH I. ENGINEERING.

FIRST CLASS.

Goodfellow, Hodson, Benton, Watkin, Arundell, Parkes, Tait, Way

SECOND CLASS.

Smijth, Wilson, Penny, Shadbolt, Kennedy, Allen, Perrin, Mills, C. A., Wynne, Newcombe, Peel, Sadler, Wilmer, Fargiter, Coles, Taylor, Collings, Vernon

THIRD CLASS.

Douglas, Hebbert, Marsh, Mills, R. H. D., Blandy, Bond, De Winton, Joyce, Carswell, Molloy, Shawe, Davidson, Chancellor, Monckton, Crampton, Inglis, Garrett, Finney, Watson

UNCLASSED.

Boyd

ABSENT.

De Morgan, Vincent

BRANCH II. MATHEMATICS.

FIRST CLASS.

Benton, Parkes, Wilson, Watkin

SECOND CLASS.

Joyce, Coles, Kennedy, Pargiter, Hodson, Marsh, Mills, R. H. D., Wynne, Arundell, Peel, Chancellor, Carswell, Inglis, Newcombe, Sadler

THIRD CLASS.

Bond, Blandy, Shadbolt, Shawe, Crampton, Perrin, Tait, Goodfellow, Mills, C. A., Davidson, Douglas, Finney, Penny, Way, Smijth, Wilmer, Hebbert, Watson, Allen, De Winton, Molloy, Collings, Taylor, Garrett, Vernon, Boyd, Monckton

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Hodson, Shadbolt, Wilson, Parkes

SECOND CLASS.

Way, Mills, C. A., Arundell, Douglas, Pargiter, Sadler, Kennedy, Wynne, Watkin, Benton, Carswell, Coles, Blandy, Goodfellow, Newcombe, Smijth

THIRD CLASS.

Inglis, Joyce, Marsh, Mills, R. H. D., Wilmer, Bond, Molloy, Peel, Davidson, Garrett, Monckton, Shawe, De Winton, Penny, Tait, Vernon, Allen, Perrin, Collings, Hebbert, Chancellor, Taylor, Watson, Boyd, Crampton, Finney

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

FIRST CLASS.

Mills, C. A., Shadbolt, Douglas, Kennedy, Newcombe, Parkes

SECOND CLASS.

Carswell, Coles, Hebbert, Hodson, Joyce, Marsh, Molloy, Monckton, Pargiter, Sadler, Arundell, Benton, Chancellor, Crampton, Inglis, Shawe, Smijth, Watson, Wilmer, Wynne

THIRD CLASS.

Davidson, De Winton, Finney, Taylor, Watkin, Way, Wilson, Allen, Blandy, Bond, Collings, Garrett, Goodfellow, Mills, R. H. D., Peel, Penny, Perrin, Tait, Vernon

UNCLASSED.

Boyd.

Qualified for the Public Service in one year, BRODIE., W. P.

SCHOLARS.

In Engineering, on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Indian Public Works Department BENTON, J.; GOODFELLOW, A. T.; HODSON, C. W.

Argyll Scholar in Natural Science, HODSON, C. W

Baker Scholar, in Applied Mechanics, BENTON, J.

PRIZEMEN.

General Proficiency, PARKES, B. (First Class in all Branches.)

Engineering — BENTON, J. and PARKES, J. (aeq.)

Surveying, WATKIN, J.

Geometrical Drawing, HODSON, C. W.

Freehand Drawing, PENNY, E.

Mathematics, BENTON, J.

Geology, COLES, G. E.

Hindustani, SHADBOLT, E. I.

Indian History, CHANCELLOR, A. J.

SECOND SESSION.

PRIZEMEN ETC., JULY 1873.

QUALIFIED FOR THE PUBLIC SERVICE IN TWO YEARS

BENTON, J., F.C.H.
HODSON, C. W.
MILLS, C. A.
WAY, R. A.
KENNEDY, R. G.
PEEL, W. DE W.*

} 6

SCHOLARS

In Engineering, on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Indian Public Works Department.

Senior Scholars.
TAIT, J.
SHADBOLT, E. I.

Junior Scholars.
MICHELL, T.
WILSON, F.
CURRY, T. E.

Argyll Scholar in Natural Science.
NEWCOMBE, A. C.
prox. acc. WILSON, W. J.

Baker Scholar in Applied Mechanics.
WILSON, W. J.
BENTON, J.

Dickens Scholar in Mathematics.
BENTON, J.

PRIZEMEN.

Allen Prize, Architectural Essay.
MILLS, R. H. D.
prox acc. WILMER, H GOODFELLOW, A. T.

President's Prize for Indian History.
COLES, G. E.

Accounts Prize, established by the Public Works Account Department, Government of India.
WILSON, W. J.

SECOND YEAR.		FIRST YEAR.
	General Proficiency—First Class in all Branches.	HORN, D. B.
	Engineering.	
BENTON, J.		CURRY, T. E.
	Surveying.	
TAIT, J.		CATTON, J. E.
	Architecture.	
ARUNDELL, E. W.		WILSON, F.
	Geometrical Drawing.	
WATKIN, J		MICHELL, T.
	Freehand Drawing.	
HEBBERT, F. B. / SHADBOLT, E. I.		TODD, A. B.
	Mathematics.	
COLES, G. E.		HORN, D. B.
	Applied Mechanics.	
BENTON, J.		
	Geology.	
TAIT, J. / WILSON, W. J.		HATTEN, J. H.
	Physics.	
HODSON, C. W.		COWPER, G.
	Hindustani.	
SHADBOLT, E. I.		HATTEN, J. H.
	Indian History.	
		SMITHE, E. DU CANE.

* See Note on next page.

SECOND SESSION.

CLASS LISTS, JULY 1873.

SECOND YEAR STUDENTS.

BRANCH I. ENGINEERING

FIRST CLASS.

Mills, R. H. D.
Tait
Shadbolt
Benton
Hodson
Arundell
Wilmer
Smijth
Kennedy

SECOND CLASS.

Way
Newcombe
Peel
Sadler
Wilson, W. J.
Pargiter
Perrin
Watkin
Wynne
Penny
Bond
Monckton
Joyce
Mills, C. A.
Collings
Carswell

THIRD CLASS.

De Morgan
Molloy
Taylor, C.
Parkes
Finney
Inglis
Vernon
Hebbert
Allen
Chancellor
Watson
Coles
De Winton
Crampton
Marsh, H.
Vincent
Shawe
Davidson
Blandy
Garrett

BRANCH II. MATHEMATICS.

FIRST CLASS.

Benton
Kennedy
Wilson, W. J.
Coles
Pargiter

SECOND CLASS.

Joyce
Hodson
Marsh, H.
Watkin
Newcombe
Arundell
Chancellor
Wynne
Sadler
Parkes
Mills, C. A.
Carswell
Mills, R. H.

THIRD CLASS.

Inglis
Shadbolt
Shawe
Finney
Bond
Penny
Blandy
Smijth
Hebbert
Peel
Perrin
Way
Tait
De Winton
De Morgan
Davidson
Vincent
Monckton
Wilmer
Crampton
Vernon
Garrett
Molloy
Watson
Collings
Taylor, C.
Allen

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Newcombe
Wilson, W. J.
Hodson
Pargiter
Shadbolt
Tait
Kennedy

SECOND CLASS.

Sadler
Arundell
Inglis
Wynne
Carswell
Coles
Mills, C. A.
Parkes
Smijth
Way
Marsh, H.
Peel
Watkin
Hebbert
Joyce
Monckton

THIRD CLASS.

Bond
Blandy
Collings
Penny
De Winton
Taylor, C.
Chancellor
De Morgan
Shawe
Vernon
Vincent
Allen
Crampton
Garrett
Molloy
Perrin
Davidson
Wilmer
Finney

UNCLASSED.

Mills, R. H. D.
Watson

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

FIRST CLASS.

Monckton
Sadler
Shadbolt
Crampton
Finney
Hebbert
Newcombe

SECOND CLASS.

Inglis
Kennedy
Molloy
Pargiter
Carswell
Marsh, H.
Mills, C. A.
Parkes

THIRD CLASS.

Arundell
Chancellor
Coles
De Winton
Shawe
Tait
Wilmer
Collings
Davidson
De Morgan
Garrett
Hodson
Joyce
Mills, R. H. D.
Perrin
Smijth
Taylor, C.
Vernon
Watkin
Way
Wilson, W. J.
Allen
Blandy
Bond
Penny
Vincent
Wynne

UNCLASSED.

Peel*
Watson

Ægrotant { Douglas / Goodfellow

* Mr. W. de Winton Peel was, notwithstanding subsequently appointed to the service in October 1873.

SECOND SESSION.

CLASS LISTS, JULY 1873.—*Continued.*

FIRST YEAR STUDENTS.

BRANCH I. ENGINEERING.

FIRST CLASS.

Michell
Wilson, F.
Curry
Catton
Gordon
Smithe, E. Du C.
Jacob
Horn
Baker

SECOND CLASS.

Knox
Learmonth
Brown
Harington
Gilbert
Todd
Tickell
Sharp
Day
Bird
Hatten
Macleane

THIRD CLASS.

Cowper
Anderson
Knapp
Moyle
Rebsch
Harris
Barnes
Forsyth
Parry
Bellasis
Bickerton
Smith, C. M.
Leslie
Watts
Carless
Handley
Christopher
Hutchings
Marsh, R. M.
Taylor, H. S.
Paul
Evans
Russell
Burlton

UNCLASSED.

Moline

BRANCH II. MATHEMATICS.

FIRST CLASS.

Horn

SECOND CLASS.

Christopher
Jacob
Michell
Bickerton
Hatten
Parry
Catton
Bellasis
Rebsch
Russell

THIRD CLASS.

Curry
Gordon
Learmonth
Moyle
Tickell
Todd
Knox
Moline
Burlton
Sharp
Marsh, R. M.
Watts
Baker
Brown
Bird
Carless
Cowper
Barnes
Harington
Harris
Taylor, H. S.
Forsyth
Handley
Leslie
Anderson
Day
Wilson, F.
Evans
Hutchings
Macleane
Gilbert
Smithe, E. Du C.
Knapp
Paul
Smith, C. M.

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Hatton
Parry
Horn

SECOND CLASS.

Curry
Paul
Harington
Wilson, F.
Knox
Michell
Barnes
Carless
Smithe, E. Du C.
Catton
Cowper
Jacob
Hutchings
Rebsch

THIRD CLASS.

Brown
Macleane
Moyle
Sharp
Marsh, R. M.
Gordon
Handley
Todd
Day
Learmonth
Moline
Baker
Bickerton
Knapp
Anderson
Forsyth
Taylor, H. S.
Watts
Bird
Christopher
Evans
Tickell
Gilbert
Burlton
Harris
Russell
Bellasis
Leslie

UNCLASSED.

Smith, C. M.

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

FIRST CLASS.

Hatten
Jacob
Brown
Harington
Horn
Smith, E. Du C.
Baker
Bellasis
Hutchings
Learmonth
Macleane

SECOND CLASS.

Forsyth
Moyle
Christopher
Cowper
Knapp
Michell
Parry
Rebsch
Smith, C. M.
Anderson
Bird
Catton
Paul
Russell
Watts

THIRD CLASS.

Barnes
Burlton
Carless
Curry
Day
Leslie
Sharp
Wilson, F.
Bickerton
Evans
Handley
Harris
Knox
Taylor, H. S.
Todd
Gilbert
Marsh, R. M.
Tickell

UNCLASSED.

Gordon
Moline

Argrotat.—Pickford.

THIRD SESSION.

PRIZEMEN, ETC., JULY 1874.

FOUNDATION EXHIBITIONER

In Engineering, on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Indian Public Works Department.

E. W. ARUNDELL, *B.A.*

SCHOLARS.

Senior Foundation Scholars.

CURREY, T. E.
JACOB, L. M.
WILSON, F.

Junior Foundation Scholars.

ROBERTS, R. W.
STUART, R. H. F.

Argyll Scholar in Natural Science.

BICKERTON, C. H. C.

Baker Scholar in Applied Mechanics.

CATTON, J. E.
acc. HARINGTON, H. S.

Dickens Scholar in Mathematics

HORN, D. B.

Allen Prize.

BROWN, J. S.

President's Prize.

HATTEN, J. J.

PRIZEMEN.

THIRD YEAR.	SECOND YEAR.	FIRST YEAR.
	General Proficiency—First Class in all Branches.	
B. PARKES, *B.E.*	HORN, D. B.	
	Engineering.	
1. WYNNE, T. R. 2. B. PARKES. *B.E.*	CURREY, T. E.	BURTON, J. D. M.
	Surveying.	
	CATTON, J. E.	ROBERTS, R. W.
	Architecture.	
	CURREY, T. E.	HADDON, H. E.
	Geometrical Drawing.	
	MICHELL, T.	REYNOLDS, G. B.
	Freehand Drawing.	
TAYLOR, C.	1. TODD, A. B. 2. GILBERT, C. F.	SIMEON, L. B.
	Notes and Reports.	
1. WILSON, W. J. 2. VERNON, H. C. E.		
	Project.	
TAIT, J.		
	Mathematics.	
B. PARKES, *B.E.*	BICKERTON, C. H. C.	SULIVAN, A.
	Applied Mechanics.	
WILSON, W. J.	HARINGTON, H. S.	SULIVAN, A.
	Chemistry.	
PARGITER, E. H.	BICKERTON, C. H. C.	ROBERTS, R. W.
	Physics.	
B. PARKES, *B.E.*	HORN, D. B.	
	Geology.	
COLES, G. E.	HORN, D. B.	SIVEWRIGHT, R. VOWELL, E. W.
	Hindustani.	
MONCKTON, M. J.	BELLASIS, E.S. JACOB, L. M.	LEYCESTER, E.
	Indian History.	
HEBBERT, F. B.		COLE, W. H.

THIRD SESSION.

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Parkes, B., *B.E., F.C.H.*
Arundell, E. W., *B.A., F.C.H.*
Pargiter, E. H.
Horn, D. B., *F.C.H.*
Watkin, John
Wilson, W. J., *F.C.H.*
Newcombe, A. C., *B.A.*
Sadler, Ralph
Mills, R. H. D.
Tait, James
Colebrook, H. W. V.
Catton, J. E.
Wynne, T. R.
Shadbolt, E. I.
Perrin, Charles
Marsh, Henry
Joyce, Alfred
Wilmer, Horace
Monckton, M. J.
Coles, G. E.
Goodfellow, A. T.
Mullaly, J. J.
Molloy, R. A.
Carswell, E. A.
Vernon, H. C. E.
Penny, Edmund
Bond, G. K.
Douglas, F. M. S.
Finney, Stephen
de Winton, W. B.
Inglis, W. A.
Taylor, Cecil
Watson, C. J. K.
Shawe, G. A. G.
Vincent, Claude
Garrett, A. H.
Allen, W. G.
De Morgan, W. C.
Chancellor, A. J.
Collings, Arthur
Davidson, J. P.
Crampton, A. C.
Smijth, E. C. Bowyer
Hebbert, F. B.

CLASS LISTS, JULY 1874.

THIRD YEAR STUDENTS.

BRANCH I. ENGINEERING.

FIRST CLASS.

Arundell, E. W., *B.A.*
Tait
Mills, R. H. D.
Parkes, B., *B.E.*
Shadbolt
Wilmer
Watkin
Wilson, W. J.
Wynne
Newcombe, A. C., *B.A.*
Perrin
Pargiter
Sadler
Vernon
Penny

SECOND CLASS.

Goodfellow
Monckton
Bond, G. K.
Douglas
Taylor, C.
Carswell
Joyce
Marsh, H.
de Winton
Molloy
Bowyer-Smijth†
Coles
Finney
De Morgan
Garrett
Allen
Watson

THIRD CLASS.

Inglis
Vincent
Shawe
Collings
Chancellor
†Crampton
Davidson
Hebbert

† Absent from part of Examination.

BRANCH II. MATHEMATICS.

FIRST CLASS.

Parkes
Joyce
Pargiter
Wilson, W. J.
Watkin
Marsh
Newcombe
Coles

SECOND CLASS.

Mills
Sadler
Arundell
Perrin
Wynne
Carswell

THIRD CLASS.

Tait
Chancellor
Shadbolt
Goodfellow
Watson
Bond, G. K.
Shawe
Inglis
Davidson
Finney
Vincent
Douglas
Molloy
Penny
Monckton
Wilmer
Collings
de Winton
Garrett
Allen
Vernon
Hebbert
De Morgan
Taylor, C.
Crampton

Ægrotat. Bowyer-Smijth

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Parkes
Pargiter

SECOND CLASS.

Sadler
Wilson
Watkin
Newcombe
Goodfellow
Tait
Arundell
Inglis
Wynne

THIRD CLASS.

Coles
Marsh
Mills
Carswell
Perrin
Joyce
Douglas
Finney
Watson
Hebbert
Allen
de Winton
Monckton
Crampton
Davidson
Garrett
Molloy
Shadbolt
Bond
Penny
Shawe
Taylor
Vincent
Bowyer-Smijth
Vernon
Wilmer
Chancellor
Collings
De Morgan

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

FIRST CLASS.

Molloy
Monckton
Parkes
Sadler
Newcombe

SECOND CLASS.

Crampton
Finney
Marsh
Perrin
Shadbolt
Carswell
Arundell
Hebbert
Mills, R. H. D.
Pargiter
Davidson
Douglas

THIRD CLASS.

Bond
Coles
Inglis
Watson
Wilmer
Joyce
Shawe
Garrett
Goodfellow
Tait
Watkin
Wynne
Chancellor
de Winton
De Morgan
Taylor
Vernon
Vincent
Wilson
Collings
Penny

UNCLASSED.

Allen

Ægrotat.—Bowyer-Smijth.

THIRD SESSION.

CLASS LISTS, JULY 1874.—*Continued.*

SECOND YEAR STUDENTS.

BRANCH I. ENGINEERING.

Final Examination.

FIRST CLASS.

Catton
Horn

Examination of Session.

Curry
Jacob, L. M.
Wilson, F.
Michell, T.
Smithe, E. du Cane
Brown
Day
Livingstone-Learmonth
Baker, H. V. S.
Harington
Gilbert
Todd
Tickell
Macleane
Sharp
Knox
Cowper
Rebsch
Bird
Hatten
Moyle
Anderson
Bickerton
Forsyth
Knapp
Leslie
Barnes
Marsh
Smith, C. M.
Taylor, H. S.
Handley
Hutchings
Bellasis
Carless
Burlton
Evans
Paul
Parry
Russell
Harris
Watts

Ægrotat—Christopher

BRANCH II. MATHEMATICS.

Final Examination.

FIRST CLASS.

Horn

SECOND CLASS.

Catton

Examination of Session.

Bickerton
Bellasis
Moyle
Michell
Hatten
Parry
Jacob
Marsh
Harington
Curry
Livingstone-Learmonth
Rebsch
Baker
Russell
Brown
Carless
Harris
Sharp
Tickell
Todd
Watts
Day
Taylor
Burlton
Hutchings
Knox
Smithe, E. du Cane
Anderson
Cowper
Forsyth
Knapp
Macleane
Wilson, F.
Barnes
Handley
Bird
Gilbert
Paul
Evans
Leslie
Smith

Ægrotat—Christopher.

BRANCH III. NATURAL SCIENCE.

Final Examination.

FIRST CLASS.

Bickerton
Hatten
Horn
Curry
Parry

SECOND CLASS.

Harington
Jacob
Michell
Cowper
Livingstone-Learmonth
Knox
Rebsch
Paul
Baker
Smithe, E. du Cane
Barnes
Brown

THIRD CLASS.

Day
Hutchings
Wilson, F.
Catton
Knapp
Sharp
Watts
Leslie
Moyle
Marsh
Tickell
Bird
Carless
Handley
Anderson
Harris
Bellasis
Russell
Gilbert
Macleane
Todd
Evans
Smith
Burlton
Taylor
Forsyth
Christopher

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

Final Examination.

FIRST CLASS.

Hatten
Bellasis
Jacob
Harington
Horn
Hutchings
Baker
Brown

SECOND CLASS.

Forsyth
Macleane
Parry
Russell
Smith
Smithe, E. du Cane
Anderson
Day
Rebsch
Bickerton
Catton
Knapp
Knox
Livingstone-Learmonth
Moyle
Paul
Taylor
Watts

THIRD CLASS.

Evans
Gilbert
Leslie
Michell
Barnes
Burlton
Cowper
Handley
Tickell
Todd
Wilson
Curry
Marsh
Bird
Carless
Harris
Sharp

UNCLASSED.

[illegible]

† Absent from part of Examination.

FIRST YEAR STUDENTS.

ORDER IN GENERAL MERIT.

Cole
Sulivan
Burton
Wolley-Dod
Roberts
Reynolds
Leycester
Atkinson
Oddie
Baker, E.
Simeon
Stuart
Michell, W.
Vowell
Clementson
Dunn
Sivewright
White
Bewley
Jameson
Dallas
Johns
Pinhey
St. Clair, Hon. L. M.
Jacob, E. F.
Haig
Newton
Clifton
Routh
Montague, J. M. *B.A.*
Baker, C. J. S.
Holme
Lang
Haddon
Mullaly, A. T.
Sutherland
Harrison
Le Quesne
Bond, W. J. H.
Hobbie

NOT PLACED.

Lewis
Goode

Ægrotat—Raban.

FOURTH SESSION.

PRIZEMEN, ETC., JULY 1875.

FOUNDATION EXHIBITIONER

HARINGTON, H. S.

SCHOLARS.

Senior Foundation Scholars.
ROBERTS, R. W.
SULIVAN, A.

Junior Foundation Scholars.
BOYCE, H. G.
FOX, H.

Argyll Scholar in Natural Science.
ROBERTS, R. W.

Dickens Scholar in Mathematics.
SULIVAN, A.

Baker Scholar in Applied Mechanics
WOLLEY-DOD, F.
prox. acc. SULIVAN, A.

Mr. Anderson's Prize, Engineering Essay.
JACOB, L.

Mr. Leonard's Prize for Practical Engineering.
KNAPP, C. B. C.

Accounts Prize, given by Members of Public Works Accounts Department, India.
MICHELL, T.

President's Prize for Indian History.
SIMEON, L. B.

PRIZEMEN.

Project and Design . . . . . REYNOLDS, G. R

THIRD YEAR.	SECOND YEAR.	FIRST YEAR.
	Engineering.	
CURRY T. E.	ROBERTS, R. W. } æq. SULIVAN, A. }	DE BRATH, S.
	Surveying.	
	ROBERTS, R. W. } æq. SULIVAN, A. }	BOYCE, H. G. } SHEDLOCK, O. J. }
	Architecture.	
	HADDON, H. E., *B.A.*	ENGLISH, R. A.
	Geometrical Drawing.	
	WOLLEY-DOD, F.	BOYCE, H. G.
	Freehand Drawing.	
	SIMEON, L. B.	TILLY, H. L.
	Mathematics.	
		HILL, C.
	Applied Mechanics.	
SELLASIE, R. S.	SULIVAN, A.	HILL, C.
	Practical Chemistry.	
	BAKER, E.	
	Physics.	
	ROBERTS, R. W.	FOX, H.
	Geology.	
	ROBERTS, R. W.	BOYCE, H. G.
	Hindustani.	
	ATKINSON R. P.	HASLAM, A. J
	Indian History.	
		ENGLISH, R. A.
	Workshop Practice	
	LE QUESNE, W. H.	

added 50+39 = 89

FOURTH SESSION.

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Curry, T. E.
Jacob, L. M.
Harington, H. S.
Michell, Theophilus
Baker, H. V. S.
Bellasis, E. S.
Wilson, Francis
Moyle, George

Bickerton, C. H. C.
Day, C. E.
Hatten, J. J., *B.A.*
Livingstone-Learmouth, A. C.
Smithe, E. DuCane
Brown, J. S.
Knapp, C. C. B.

Tickell, Charles
Reynolds, G. B.
Rebsch, Samuel
Sharp, Frederick
Parry, J. W.
Knox, H. C.
Cowper, Gerard
Gilbert, C. F.

Todd, A. B.
Anderson, G. A.
Hutchings, H. B.
Marsh, R. M.
Bird, W. L.
Leslie, Morice
Smith, C. M.
Forsyth, J. H. P.

Taylor, H
Watts, G. K.
Barnes, H. C.
Russell, A. S.
Handley, J. H.
Harris, G. S. T
Paul, J. E.
Carless, G. P.

As Assistant Engineers, Third Grade.

Burlton, C. H. B. | Evans, H. E. G. | Macleane, A. D.

CLASS LISTS, JULY 1875.

FINAL EXAMINATION.

THIRD YEAR.

BRANCH I. ENGINEERING.

FIRST CLASS.

Curry
Jacob, L.
Michell, T.
Wilson

SECOND CLASS.

Baker, H. V. S.
Day
Harington
Smithe, E. du C.
Sharp
Tickell
Livingstone-Learmonth
Brown
Knapp
Gilbert
Moyle

THIRD CLASS.

Anderson
Rebsch
Bird
Todd
Knox
Cowper
Bellasis
Bickerton
Hatten, J. J. *B.A.*
Smith, C. M.
Marsh
Handley
Barnes
Hutchings
Leslie
Forsyth
Taylor
Watts
Harris
Russell
Paul
Parry
Carless

BRANCH II. MATHEMATICS.

FIRST CLASS.

Bellasis

SECOND CLASS.

Bickerton
Moyle
Parry
Harington
Hatten, J. J., *B.A.*
Curry
Michell, T.
Jacob, L.
Marsh
Tickell
Livingstone-Learmonth
Baker, H. V. S.
Brown
Rebsch

THIRD CLASS.

Carless
Russell
Harris
Sharp
Watts
Todd
Day
Knox
Smithe, E. du C.
Taylor
Anderson
Cowper
Hutchings
Forsyth
Knapp
Barnes
Wilson
Gilbert
Handley
Bird
Leslie
Paul
Smith, C. M.

UNCLASSED.

Burlton
Evans
Macleane

SECOND YEAR.

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Roberts
Baker, E.

SECOND CLASS.

Dunn
Wolley-Dod
Burton
Cole
Atkinson
Baker, C. J. S.
Simeon
Vowell
Lewis
Routh
Montague, J. M. *B.A.*
Mullaly
Pinhey
Michell, W.
Oddie
Sullivan

THIRD CLASS.

Bewley
Gordon *
Leycester
Johns
St. Clair, Hon. L. M.
Sivewright
Sutherland
Stuart
Dallas
Clementson
Harrison
White, J. C.
Haddon, H. E., *B.A.* *
Holme
Haig
Jacob, E. F.
Newton
Reynolds
Clifton
Lang
Bond
Scoble
Coode
Le Quesne

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

FIRST CLASS.

Atkinson
Montague, J. M., *B.A.*
Burton
Leycester
Dallas
Johns
Simeon

SECOND CLASS.

Cole
Michell, W.
Oddie
Roberts
Coode
Pinhey
Clifton
Mullaly
Scoble
Haddon, H. E., *B.A.*
Jacob, E. F.
Sivewright
Sutherland
Baker, C. J. S.
Stuart

THIRD CLASS.

Bewley
Routh
White, J. C.
Wolley-Dod
Clementson
Lewis
Vowell
Baker, E.
Dunn
Harrison
Holme
Lang
St. Clair, Hon. L. M. *
Bond *
Gordon
Haig
Newton
Reynolds *
Sullivan
Le Quesne

* *Absent from part of the Examination.*

FOURTH SESSION.

CLASS LISTS, JULY 1875.

ANNUAL EXAMINATION.

SECOND YEAR.

BRANCH I. ENGINEERING.

Final Examination.

FIRST CLASS.

Reynolds

Examination of Session.

Roberts
Sullvan
Yowell
Wolley-Dod
Dunn
Simeon *
Stuart
Cole
Burton
Michell, W.
Lang
Mullaly
Gordon
Oddie
Pinhey
Clementson
Baker, E.
Lewis
White, J. C.
Newton
Montague, J. M., *B.A.*
Baker, C. J. S.
Dallas
Haig
Le Quesne
Johns
Sutherland
Haddon, H. E., *B.A.* *
Coode
Atkinson
Holme
Routh
St. Clair, Hon. L.M.*
Bewley
Clifton
Leycester
Jacob, E. F.
Harrison
Sivewright
Scoble

NOT PLACED.

Bond

BRANCH II. MATHEMATICS.

Final Examination.

SECOND CLASS.

Reynolds

Examination of Session.

Sullvan
Haddon, H. E., *B.A.*
Michell, W.
Wolley-Dod
Leycester
Sivewright
Barton
Roberts
Cole
Jacob, E. F.
Baker, E.
Oddie
Montague, J. M., *B.A.*
Gordon
Simeon *
Clementson
Pinhey
Johns
Haig
Stuart
Bewley
Dunn
Yowell
Routh
Atkinson
Lewis
Sutherland
Baker, C. J. S.
Lang
Newton
Mullaly
White, J. C.
Dallas
Holme
St. Clair, Hon. L. M.*
Harrison
Clifton
Le Quesne
Coode
Scoble

NOT PLACED.

Bond*

FIRST YEAR.

ORDER IN ALL BRANCHES.

Boyce
Fox
Hebbert
Hill
George, D.
Tebbs
Newham
English
Reilly
Rose
Smith, W.
Brath De.
Sheilock
Horne
Cresswell
Ivens
George, A. S.
Hutchinson
Morley
White, G. G.
Haslam
Leefe
Chanter
Hewitt
Cameron
Gabbett
Denne
Summers
Wallace
Talbot
Hight
Leventhorpe
Saville
Tilly
Darling
Malet
Home
Lambert
Uselier
Wright
Yates
Cuthbertson
Dashwood
Jopp
Young

NOT PLACED.

Howat
Manson
Sage

* *Absent from part of the Examinations.*

FIFTH SESSION.

PRIZEMEN, ETC., JULY 1876.

FOUNDATION EXHIBITIONER

In Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Indian Public Works Department.

SULIVAN, A.

FOUNDATION SCHOLARS.

Senior.	Junior.
BOYCE, H. G.	WOODS, R. J., *B.E.*
REILLY, FRED.	CHADWICK, W.
acc. SUMMERS, T.	

Argyll Scholar in Natural Science.
FOX, H.

Dickens Scholar in Mathematics.
HILL, C.

Public Works Committee of the Council of India Scholar in applied Mechanics.
HEBBERT, H. L.
prox. acc. HILL, C.

PRIZEMEN.

Mr. Leonard's Prize for Practical Engineering.
LANG, F.

Accounts Prize given by the Members of the Public Works Account Department, India.
DUNN, G. O. W.

President's Prize for Indian History
ENGLISH, R. A.

Allen Prize for Architectural Essay.
CLEMENTSON, E. H.

Engineering.

Third Year.	Second Year.	First Year.
SULIVAN, A.	REILLY, F.	WOODS, R. J., *B.E.*
Projects and Designs.		
SULIVAN, A.		
	Surveying.	
	BOYCE, H. G. } aeq.	MACKENZIE, N. F.
	FOX, H. }	
	Architecture.	
	HORNE, A.	PRICKETT, L. G.
	Geometrical Drawing.	
	SUMMERS, T.	1. WOODS, R. J., *B.E.* }
		2. NICOLLS, J. R. C. }
	Freehand Drawing.	
	TILLY, H. L. }	LUCAS, H. A. }
	acc. REILLY, F. }	*acc.* TUFNELL, C. F. }
	Workshop Practice.	
	CHANTER, F. W.	GREENLEES, A.
	Mathematics.	
	BOYCE, H. G.	WOODS, R. J., B.E.
Applied Mechanics.		
WOLLEY-DOD, F.	HILL, C.	WOODS, R. J., B.E.
	Chemistry.	
	ENGLISH, R. A.	CHADWICK W.
	Practical Chemistry.	
	TILLY H. L.	
	Geology.	
	WALLACE, J.	CONES, J. A. } aeq.
		FRASER, E. G. }
	Hindustani.	
	HASLAM, A. J.	STEPHEN, K. H.
	Indian History.	
		MCLEOD, N. F.

89+46 - 129

FIFTH SESSION.

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Sullivan, Arthr., *F.C.H.*
Wolley-Dod, F., *F.C.H.*
Roberts, R. W., *F.C.H.*
Burton, J. D. M.
Cole, W. H.
Simeon, L. B.
Michell, William
Vowell, E. W.

Oddie, H. J.
Haddon, H. E., *B.A.*
Dunn, G. O. W.
Montague, J. M. *B.A.*
Stuart, R. H. F.
Leycester, Edward
Jacob, E. F.
Pinhey, Edward

Baker, Edward
Atkinson, R. P.
Lang, Francklyn
Baker, C. J. S.
White, J. C.
Mullaly, A. T.
St. Clair, Hon. L. M.
Johns, E. H.

Lewis, W. C.
Dallas, J. E.
Clementson, E. H.
Sivewright, Robert
Bewley, Alexander
Gordon, E. F.
Routh, R. S. J.
Haig, W. S.

Sutherland, A
Coode, M. F
Holme, C. I
Clifton, C. N
Newton, W.
Le Quesne, W
Scobie, M. J.
Harrison, A.

CLASS LISTS, JULY 1876.

FINAL EXAMINATION.

THIRD YEAR.

BRANCH I. ENGINEERING.

FIRST CLASS.

Sullivan
Roberts
Wolley-Dod
Simeon
Vowell
Cole
Lang
Dunn

SECOND CLASS.

Stuart
Burton
Michell
White, J. C.
Mullaly
Jacob
Pinhey
Oddie
Baker, C. J. S.
Montague, J. M., *B.A.*
St. Clair, Hon. L. M.
Haddon, H. E., *B.A.*

THIRD CLASS.

Haig
Lewis
Gordon
Clementson
Le Quesne
Routh
Sutherland
Baker, E.
Newton
Bewley
Coode
Dallas
Atkinson
Johns
Harrison
Clifton
Holme
Leycester
Sivewright
Scobie

BRANCH II. MATHEMATICS.

FIRST CLASS.

Sullivan
Haddon, H. E., *B.A.*
Wolley-Dod
Burton
Roberts
Leycester
Michell

SECOND CLASS.

Cole
Sivewright
Baker, E.
Jacob
Oddie
Simeon
Montague, J. M., *B.A.*
Pinhey
Stuart
St. Clair, Hon. L. M.
Gordon
Haig
Baker, C. J. S.
Bewley
Johns
Clementson

THIRD CLASS.

Dallas
Holme
Routh
Atkinson
Lang
Mullaly
Newton
Vowell
Lewis
Sutherland
White
Dunn
Clifton
Coode
Harrison
Scobie
Le Quesne

SECOND YEAR.

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Fox

SECOND CLASS.

George, D.
English
Boyce
Reilly
Smith
Horne
Morley
De Brath
Rose
Gabbett
Tilly
Wallace
Yates, O. V.

THIRD CLASS.

Cresswell
Hebbert
George, A. S.
Dashwood
Hewitt
Holme
Ivens
Tebbs
Cameron
Savielle
Young
Shedlock
Ussher
Darling
Wright
Sage
Summers
Cuthbertson
Hight
Jopp
Leventhorpe
Newham
Chanter
Denne
Hill
Hutchinson
Lambert
Talbot
White, G. G.
Leefe
Malet
Haslam
Manson

BRANCH IV. HINDUSTANI AND INDIAN HISTOR

FIRST CLASS.

English
Fox
Newham
Smith
Haslam
Savielle

SECOND CLASS

Boyce
Shedlock
Hewitt
Horne
Cresswell
De Brath
Reilly
George, D.
Manson
Morley

THIRD CLASS

Cameron
Gabbett
White, G. G.
Tebbs
Chanter
Ivens
Leefe
Talbot
Young
Cuthbertson
Denne
Sage
Wright
Yates, O. V.
Dashwood
Hebbert
Leventhorpe
Malet
Rose
Wallace
Chanter
Horne
Summers
Ussher
George, A. S.
Hutchinson
Tilly
Darling
Hight
Hill
Jopp
Lambert

FIFTH SESSION.

CLASS LISTS, JULY 1876.

ANNUAL EXAMINATION.

SECOND YEAR.

BRANCH I. ENGINEERING.

Boyce
Reilly
Summers
Hebbert
Newham
De Brath
Fox
Wallace
Smith
English
Tebbs
Shedlock
Tilly
Hutchinson
George, A. S.
Malet
Cresswell
Chanter
Hill
Horne
Leventhorpe
Dashwood
Darling
Sage
Talbot
White, G. G.
Right
Ivens
Cameron
Manson
Denne
George, D.
Morley
Horne
Savielle
Haslam
Usher
Gabbett
Cuthbertson
Hewitt
Jopp
Leefe
Rose
Wright
Yates, O. V
Lambert
Young

BRANCH II. MATHEMATICS.

Hill
Boyce
Hebbert
Rose
English
Hutchinson
Ivens
Fox
Leefe
George, D.
George, A. S.
Hewitt
Reilly
Summers
Wallace
Tebbs
Cameron
Lambert
Morley
Wright
Smith
Shedlock
Chanter
Cresswell
Horne
Horne
Savielle
De Brath
Leventhorpe
Newham
Talbot
Haslam
Dashwood
Malet
Yates, O. V.
Jopp
Usher
Young
Gabbett
Right
White, G. G.
Cuthbertson
Denne
Darling
Manson
Tilly

NOT PLACED.

Sage.

FIRST YEAR.

ORDER OF GENERAL MERIT.

Woods, R. J., *B.E.*
Chadwick
Prickett
Cones
Greenlees
Mackenzie
Nicolls
Fraser
Hicks
McLeod
Brooke
Fowler
Lloyd
Burt
Lucas
Mason
Vaughan
Ritchie
Tufnell
de Winton
Boase
Menneer
Pickwood
Bennett
Price
Egerton
Stephen
Martyr
Dawson
Rogers
Barrat
Ede
Elliott
Morse
Pope
Yates, R. B.
Lees
O'Connell
Tickell
Trevor
Rawson
Lepper
Bird
Thomson

NOT PLACED

Lang
Pemberton
Rebsch

SIXTH SESSION.

PRIZEMEN, ETC., JULY 1877.

FOUNDATION EXHIBITIONER

In Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Indian Public Works Department.

BOYCE, H. G.

FOUNDATION SCHOLARS

In Engineering on the same Fund.

Senior.	Junior.
PRICKETT, L. G.	WYATT, J. W.
WOODS, R. J. *B.E.*	MCCONNEL, W. H.
acc. GREENLEES, A.	

Argyll Scholar in Natural Science.
CHADWICK, W.

Dickens Scholar in Mathematics.
WOODS, R. J., *B.E.*

Public Works Committee of the Council of India Scholar in applied Mechanics
HICKS, A.
acc. STEPHEN, K. H.

PRIZEMEN.

Mr. Leonard's Prize for Practical Engineering.
REILLY, F.

Accounts Prize given by the Members of the Public Works Account Department. India.
ENGLISH, R. A.

President's Prize for Indian History.
MCLEOD, N. F. | *acc.* CONES, J. A.

Engineering.

Third Year.	Second Year.	First Year.
REILLY, F. DE BRATH, S	PRICKETT, L. G.	WYATT, J. W.

Surveying.

	MACKENZIE, N. F.	WYATT, J. W. PEDLEY, W. E.

Architecture.

	FRASER, E. G.	WYATT, J. W.

Geometrical Drawing.

	GREENLEES, A. *acc.* WOODS, R. J., *B.E.*	WYATT, J. W.

Estimating.

	FRASER, E. G.	

Freehand Drawing.

	LUCAS, H. A. *acc.* FOWLER, F. D.	FOORD, A. M *acc.* GRAHAM, H. J.

Workshop Practice.

	BOASE, J. T.	HANSON, E. B.

Mathematics.

		WYATT, J. W

Applied Mechanics.

HILL, C. BOYCE, H. G.	WOODS, R. J., *B.E.*	WYATT, J. W.

Physics.

	FRASER, E. G.	WYATT, J. W.

Practical Chemistry.

	PRICKETT, L. G. *prox* CHADWICK, W. *acc.* MACKENZIE, N. F.	

Geology.

		HILL, A.

Hindustani.

	STEPHEN, K. H.	HENDERSON, J. P.

Indian History.

		WYATT, J. W.

Gymnastics.
CAMERON, W. L. S. L.

129 + 49 = 178

SIXTH SESSION.

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Boyce, H. G., *F.C.H.*
English, R. A.
Reilly, Fredck., *F.C.H.*
De Brath, Stanley
Fox, Henry
Hebbert, H. L.
Hill, Clement
Newham, W. E.
Smith, Walter
Shedlock, O. J.
Tebbs, F. E.
Summers, Thomas
Wallace, James
Horne, Arnold
Rose, G. P.
Cresswell, P. H.
Ivens, J. H. A.
George, Duncan
Hutchinson, W. C.
White, G. G.
Savielle, G. A.
Morley, G. S.
George, A. S.
Hewitt, St. J.
Leventhorpe, J. B.
Haslam, A. J.
Chanter, F. W.
Leefe, C. O.
Hight, A. E.
Yates, O. V.
Denne, R. T.
Home, Walter
Wright, T. H.
Cameron, W. L. S. L.
Dashwood, J. A.
Gabbett, J. E.
Talbot, H. S.
Tilly, H. L.
Cuthbertson, A. E.
Darling, W. A.
Ussher, C. J.
Sage, E. M.
Manson, G. E.
Malet, A. A. G.
Jopp, William
Lambert, G. B.
Young, B. H.

Non-resident Student.

Borrah, Boli Narayan
(Passed Dec. 13, 1877.

CLASS LISTS, JULY 1877.
FINAL EXAMINATION.

THIRD YEAR.

BRANCH I.
ENGINEERING.

FIRST CLASS.

Reilly
Boyce
De Brath
Summers

SECOND CLASS.

English, Fox
Hebbert
Smith, W.
Newham, Wallace
Shedlock
Tebbs

THIRD CLASS.

Leventhorpe, J. B.
Savielle, White
Hill, C.
Cresswell, Hutchinson, Ivens, Horne, Tilly
Chanter
Hight
Darling, George, A. S.
Haslam
Sage
Dashwood
Denne
Manson, Talbot, Malet, Rose

BRANCH II.
MATHEMATICS.

FIRST CLASS.

Hill, C.
Boyce
Hebbert
Rose
English

SECOND CLASS.

Hutchinson
Tebbs
George, A., Ivens
Leefe
George, D.
Fox, Wallace, Hewitt, Reilly

THIRD CLASS.

Morley, Summers
Cresswell
Shedlock
De Brath
Newham
Cameron, Home, Horne
Wright
Smith
Chanter
Lambert, Leventhorpe, J. B., Savielle

PASSED.

Cuthbertson
Gabbett
Jopp
Ussher
Yates, O. V.
Young

SECOND YEAR.

BRANCH III.
NATURAL SCIENCE.

FIRST CLASS.

Chadwick
Woods
Cones
Prickett
Fraser, E. G.

SECOND CLASS.

Burt
Fowler, Mackenzie
Trevor

THIRD CLASS.

Bennett, Boase, Egerton, Greenlees, Hicks, McLeod, Mason, Nicolls, Lloyd, Price, Pope, Ritchie
Ede
Barratt, Lucas, Rogers
Pickwood

BRANCH IV.
HINDUSTANI & INDIAN HISTORY

FIRST CLASS.

Stephen
Cones, McLeod

SECOND CLASS.

Chadwick
Barratt, Pope, Prickett
Hicks
Bird

THIRD CLASS.

de Winton, Mason, Ritchie, Boase, Woods, Mackenzie, Tufnell, Fraser, E. G., Nicolls
Burt
Fowler
Lloyd
Lucas
Martyr
Pickwood, Rawson

PASSED.

Brooke
Dawson
Elliot
Lees
Lepper
Menteer
Morse, A.
O'Connell
Thomson
Tickell
Yates, R. B.

NOT PLACED.

Ede

SIXTH SESSION.

CLASS LISTS, JULY 1877.

ANNUAL EXAMINATION.

SECOND YEAR.

BRANCH I. ENGINEERING.

In order of merit.

Prickett
Greenlees
Woods
Nicolls
Lucas
Hicks
Chadwick
Burt
Fraser, E. G.
Cones
Tufnell
Fowler
Dawson
Mason
Morse, A.
Rouse
McLeod
Mackenzie
Lloyd
Pickwoad
Thomson
de Winton
Ede
Martyr
O'Connell
Ritchie
Lees
Tickell
Elliot
Barratt
Lepper
Price
Brooke
Egerton
Pope
Yates, R. B.
Rogers
Rawson
Bennett
Stephen
Bird
Trevor
Menneer

BRANCH II. MATHEMATICS.

In order of merit.

Woods
Chadwick
Hicks
Menneer
Greenlees
Lloyd
Stephen
Prickett
Cones
Brooke
Dawson
Mackenzie
Nicolls
Rogers
Trevor
Burt
Mason
Egerton
McLeod
Tufnell
Pickwoad
Price
Fowler
Fraser, E. G.
Lees
Lepper
Rawson
Rouse
Bird
Tickell
Yates, R. B.
Barratt
Elliot
Morse, A.
Bennett
Pope
Thomson
de Winton
O'Connell
Martyr
Lucas
Ritchie

NOT PLACED.

Ede

FIRST YEAR.

ORDER OF GENERAL MERIT.

IN ALL BRANCHES.

Wyatt
McConnel
Tuck
Coy
Hill, A.
Heaven
Savory
Strange
Fagan
Clayton
Pedley
Frost
Roche
Cole
Schofield
Smith, F. St. G. M.
Fraser, L. R.
Scott
Hayes
Morse, G. H.
Kench
Pemberton
Butler
Bestic
Gordon
Anstruther
Bestic
Lewin
Muntz
Wathen*
Bonham-Carter
Foord
Hanson
Herbert
Macdonald
Campbell
Wilson
Henderson
Lang
Collett
Leventhorpe, A.
Jackson
Claudet
Montrésor
Turnbull
Boden
Dorman

NOT PLACED.

Graham

* *Absent from part of the Examination.*

SEVENTH SESSION.

PRIZEMEN, ETC., JULY 1878.

APPOINTED FELLOWS OF COOPERS HILL.

WOODS, R. J., *B.E.* | CHADWICK, W. | PRICKETT, L. G.

FOUNDATION EXHIBITIONER

In Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Indian Public Works Department.

CHADWICK, W.

FOUNDATION SCHOLARS

In Engineering on the same Fund.

Senior.	Junior.
WYATT, J. W.	DYSON, R. C.
PEDLEY, W. E.	ALEXANDER, E. J.

Argyll Scholar in Natural Science.
ROCHE, H.

Dickens Scholar in Mathematics, given by Col. the Hon. Sir A. Clarke, K.C.M.G., R.E.
HILL, A.

Public Works Committee of the Council of India Scholar in Applied Mechanics.
MCCONNEL, W. H.

PRIZEMEN.

Accounts Prize, given by the Members of the Public Works Account Department, India.
CHADWICK, W.

President's Prize for Indian History.
SAVORY, H. G. S.

Engineering.

Third Year.	Second Year.	First Year.
GREENLEES, A.	WYATT, J. W.	MAW, M. H.

Surveying.

	WYATT, J. W.	NORRIS, M. O. / SQUIRE, S. N.

Architecture.

	WYATT, J. W.	DYSON, R. C.

Geometrical Drawing.

	WYATT, J. W.	NORRIS, M. O.

Freehand Drawing.

	WILSON, F. J.	GRAHAM. H. J.

Workshop Practice.

	HANSON, E. B.	NORRIS, M. O.

Mathematics.

		DYSON, R. C.

Applied Mechanics.

CHADWICK, W.

Applied Mechanics and Mathematics.
WYATT, J. W.

Designs.

HICKS, A.

Project.

WOODS, R. J., *B.E.*

Chemistry.

HEAVEN, F. G.	MAW, M. H.

Practical Chemistry.
COX, J. P.

Geology.

	GUINNESS, H. S.

Hindustani.

SAVORY, H. G. S.	SALTER, E. G.

Indian History.

	SALTER, E. G.

Gymnastics.
TICKELL, J. R.

Telegraph Department, general proficiency.
BERRINGTON, T. D. D.

178+39=217

SEVENTH SESSION.

PRIZEMEN, ETC., JULY 1878.—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE:—

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Woods, R. J., *F.C.H.*	Burt, H. P.	Fraser, E. G.	Martyr, C. C.	Rawson, F.
Chadwick, W., *F.C.H.*	Stephen, K. H.	Mason, A. H.	Barratt, C. H.	Lepper, F.
Prickett, L. G., *F.C.H.*	Mackenzie, N. F.	Tufnell, C. F.	de Winton, T. W.	Lees, O. C.
Greenlees, A.	Boase, J. T.	Dawson, E. F.	Egerton, R. W.	O'Connell, H. H.
Hicks, A.	Lloyd, E. R. S.	Morse, A.	Ritchie, A. S. M.	Tickell, J. R.
Cones, J. A.	Fowler, F. D.	Brooke, J. H.	Thomson, A. S.	Elliot, E. C.
McLeod, N. F.	Lucas, H. A.	Price, P. L. A.	Menneer, R. R.	*Extra Student.*
Nicolls, J. R. C.		Pope, F. J.	Trevor, A. S.	Harris, F.

As Assistant Engineers, Third Grade.

Rogers, P. P. | Bennett, H. W. | Yates, R. B. | Bird, W. J. A.

As Assistant Superintendents, Telegraph Department.

Berrington, T. D. D.
Dempster, F. E.
Palmer, A. L.
Woodward, H. S.
Hensley, J. W.
Pinhey, H. T.
James, C. S.

CLASS LIST.

THIRD YEAR.

BRANCH I. ENGINEERING.

FIRST CLASS.

Woods
Greenlees
Prickett
Chadwick
Hicks

SECOND CLASS.

Lucas
Burt
Nicolls
Cones
Boase
Fowler
Mason
Tufnell
Dawson

THIRD CLASS.

Morse
Mackenzie
McLeod
Fraser, E. G.
Lloyd
Thomson
Tickell
Martyr
Lepper
Stephen

BRANCH II. MATHEMATICS.

FIRST CLASS.

Woods
Chadwick

SECOND CLASS.

Greenlees
Stephen
Hicks
Prickett
Lloyd
Menneer

THIRD CLASS.

Brooke
Cones
Mackenzie
Dawson
Nicolls
McLeod
Boase
Burt

SECOND YEAR.

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Roche
Strange
Coy
Scott

SECOND CLASS.

Wyatt
Heaven
Fraser, L. R.
Tuck
McConnel
Wathen

THIRD CLASS.

Bonham-Carter
Hill
Muntz
Frost
Hanson
Herbert
Savory
Cole
Pedley
Pemberton
Schofield
Fagan
Hayes
Kench
Smith, F. St. G. M.
Wilson

SEVENTH SESSION.

ANNUAL EXAMINATION, JULY 1878.—*Continued.*

SECOND YEAR.

BRANCH I. ENGINEERING.

Wyatt
Pedley
Strange
Schofield
Tuck
Coy
Roche
Fagan
Fraser, L. R.
Hill
McConnel
Smith, St. G. M.
Hanson
Frost
Wilson
Bestic
Clayton
Hayes
Kench
Macdonald
Foord
Scott
Bonham-Carter
Cole
Savory
Collet
Lewin
Wathen
Lang
Claudet
Herbert
Gordon
Dorman
Heaven
Henderson
Butler
Montresor
Muntz
Anstruther
Pemberton
Leventhorpe
Campbell
Roden
Boyle*

BRANCH II. MATHEMATICS.

Wyatt
Hill
McConnel
Tuck
Heaven
Coy
Cole
Boyle
Frost
Herbert
Butler, T., *B.A.*
Savory
Gordon
Strange
Clayton
Lewin
Smith, F. St. G. M.
Fagan
Fraser, L. R.
Macdonald
Pedley
Schofield
Hayes
Dorman
Muntz
Roden
Bonham-Carter
Collet
Lang
Roche
Anstruther
Bestic
Leventhorpe
Foord
Henderson
Montresor
Hanson
Campbell
Kench
Scott
Wilson
Claudet
Wathen*

Not Placed.

Pemberton

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

Savory
Heaven
Anstruther
Fagan
Wyatt
Kench
Henderson
Campbell
Hill
Clayton
Macdonald
Scott
Tuck
Lewin
McConnel
Schofield
Smith, F. St. G. M.
Leventhorpe
Coy
Herbert
Pemberton
Strange
Bonham-Carter
Roche
Wilson
Bestic
Foord
Frost
Montresor
Fraser, L. R.
Gordon
Lang
Muntz
Pedley
Boyle
Cole
Hayes
Roden
Butler
Claudet
Collet
Dorman
Hanson
Wathen*

FIRST YEAR.

ORDER OF GENERAL MERIT IN ALL BRANCHES.

Dyson
Alexander
Manson
Maw
Salter
Woolcombe
Nethersole
Johns
Sweet, G. W.
Guinness
Lee
Scratchley
Heath
Norris
Graham
Strickland
Huskisson
Squire
Faulkner
Carter
Grant
Smith, C. A.
Ash
Landon
Johnston
Clerk
Jones
Perceval
Curry
Sweet, W. McM.
Blacker
Bowden
Maconchy
Pears
La Touche
Yates, H. B.
Mills
Wakefield
Fitzgibbon
Handcock, W. E. F.
Handcock, J.

Not Placed.

Donnan

* *Absent from part of the Examination.*

EIGHTH SESSION.

PRIZEMEN, ETC., JULY 1879.

APPOINTED FELLOWS OF COOPERS

WYATT, J. W. | HILL, A. | TUC

FELLOWS' SCHOLAR.

Established by the Fellows of Coopers Hill

WYATT, J. W.

FOUNDATION SCHOLARS

In Engineering on the Coopers Hill Endowment Fund, esta
Engineers of the Public Works Departmen

Senior. Jun

NETHERSOLE, M. MAW, M. H. | WEBB, A. L.

Argyll Scholar in Natural Science.

GUINNESS, H. S.

Dickens Scholar in Mathematics, given by Col. the Hon. Sir A. C

DYSON, R. C.

Public Works Committee of the Council of India Scholar in A

ALEXANDER, E. J. | DYSON, R.

PRIZEMEN.

Accounts Prize, given by the Members of the Public Works Accou

WYATT, J. W.

President's Prize for Indian History.

SALTER, E. G.

Engineering.

THIRD YEAR. SECOND YEAR.

WYATT, J. W. | ALEXANDER, E. J. | CHI
HILL, A.

Surveying.

ALEXANDER, E. J. | DEU

Architecture.

NETHERSOLE, M.
prox. acc. CURRY, W. E.

Geometrical Drawing.

NORRIS, M. O. | BAT

Estimating.

FAGAN, A. M.

Freehand Drawing.

MILLS, G. | OLPI

Workshop Practice.

MAW, M. H. | MIL
acc. WOOLLCOMBE, R.

Mathematics.

| WEB
| DEU

Applied Mechanics.

WYATT, J. W.
MCCONNEL, W. H.

Physics.

MAW, M. H. | MIL
prox. acc. GUINNESS, H. S.

Geology.

GUINNESS, H. S. | GAR
prox

Project and Designs.

WYATT, J. W.
TUCK, E. H.

Hindustani.

SAVORY, H. G. S. | GILE

Indian History.

| MAJ

Gymnastics.

| PYM,

Telegraph Department

Telegraphy.—MATHEWS, H. M. S.

217739-256

EIGHTH SESSION.

PRIZEMEN, ETC., JULY 1879—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Wyatt, J. W., *F.C.H.*	Pedley, W. E.	Boyle, A. R.	Herbert, D. W.	Campbell, W. B.
Hill, A., *F.C.H.*	Roche, H.	Clayton, R. O.	Wilson, F. J.	Butler, T.
Tuck, E. H., *F.C.H.*	Fagan, A. M.	Scott, F. W. M.	Bestic, W. B.	Leventhorpe, A.
McConnel, W. H.	Smith, F. St.G. M.	Bonham-Carter, L. B. G.	Hanson, E. B.	Montrésor, C. E. C.
Strange, W. L.	Macdonald, A. R.	Cole, C. J.	Kench, H.	Gordon, W. B.
Coy, J. P.	Fraser, L. R.	Hayes, A. M.	Anstruther, W. T.	Henderson, J. P.
Savory, H. G. S.	Frost, H. F. B.	Lewin, A. J.	Foord, A. M.	Claudet, F. B.
Heaven, F. G.	Schofield, J. A.		Wathen, H. A. D.	Muntz, W. E.

As Assistant Engineers, Third Grade.

Collet, J. F. H. | Dorman, R. H. | Lang, R. D. M. | Roden, H. H.

As Assistant Superintendents, Telegraph Department.

Mathews, H. M. S.	Smith, H. W.	Shaw, W. M.
Lees, R. O.	Madge, P. M.	Barker, R. C.

HONOURS LIST.

THIRD YEAR.

BRANCH I. ENGINEERING.

FIRST CLASS.

Wyatt
Strange
Tuck
Hill, A.
Pedley

SECOND CLASS.

Coy
Fraser
Fagan
Smith, F. St.G. M.
McConnel
Roche
Macdonald

THIRD CLASS.

Schofield
Frost
Savory
Hayes
Wilson
Hanson
Bonham-Carter
Foord, A. M.
Lewin
Bestic
Scott

BRANCH II. MATHEMATICS.

FIRST CLASS.

Wyatt
Hill, A.
McConnel
Tuck

SECOND CLASS.

Boyle
Herbert
Heaven

THIRD CLASS.

Cole
Coy
Savory
Butler
Frost
Lewin
Pedley
Cordon
Strange
Clayton.

BRANCH IV. HINDUSTANI AND INDIAN HISTORY.

FIRST CLASS.

Savory
Heaven
Anstruther

SECOND CLASS.

Macdonald
Fagan
Henderson
Kench
Wyatt
Campbell
Clayton

THIRD CLASS.

Hill, A.
Tuck
Leventhorpe
Lewin
Scott
Smith, F. St.G. M.
Schofield
Coy
Boyle
Herbert
Strange
Bonham-Carter
Frost
McConnel
Wilson
Foord, A. M.
Gordon
Montrésor
Roche

SECOND YEAR.

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Guinness
Maw

SECOND CLASS.

Johnston
Wakefield
Perceval
Squire
Sweet, W. McM.
Norris.

THIRD CLASS.

Curry
Tyson
Alexander
Blacker
Johns
Manson
Bowden
Fitzgibbon
La Touche
Woollcombe
Grant
Nethersole
Shaw, W. R.
Heath
Maconchy
Landon
Lee
Yates

EIGHTH SESSION.

PRIZEMEN, ETC., JULY 1879—*Continued.*

ANNUAL EXAMINATION.

SECOND YEAR.

BRANCH I. ENGINEERING.

Alexander.
Nethersole*
Dyson
Maw
Norris
Manson
Johns
Graham
Heath
Squire
Perceval
Woollcombe
Bowden
Strickland
Curry
Faulkner
Lee
La Touche
Mills, G.
Maconchy
Sweet, G. W.
Yates, H. R.
Guinness
Johnston
Salter
Scratchley
Grant
Landon
Carter
Clerk
Jones
Smith, C. A.
Sweet, W. McM.
Johns
Ash
Pears
Fitzgibbon
Donnan
Wakefield*
Blacker
†Shaw

BRANCH II. MATHEMATICS.

Dyson
Alexander
Shaw, W. R.
Woollcombe
Manson
Johns
Jones
Curry
Heath
Guinness
Maw
Squire
Maconchy
Johnston
Salter
Sweet, G. W.
Donnan
Nethersole
Scratchley
Grant
La Touche
Smith, C. A.
Norris
Lee
Sweet, W. McM.
Carter
Strickland
Fitzgibbon
Mills, G.
Graham
Landon
Pears
Perceval
Ash
Blacker
Faulkner
Bowden
Wakefield
Clerk
Yates.

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

Salter
Johns
Ash
Nethersole
Lee
Carter
Grant
Strickland
Faulkner
Pears
Sweet, G. W.
Heath
Scratchley
Smith, C. A.
Landon
Blacker
Curry
Dyson
Graham
Clerk
Alexander
Squire
Manson
Maw
†Shaw, W. R.
Woollcombe
Guinness
Mills, G.
Sweet, W. McM.
Fitzgibbon
Johnston
Maconchy
La Touche
Norris
Bowden
Donnan
Wakefield
Perceval
Jones
Yates

FIRST YEAR.

ORDER OF GENERAL MERIT. IN ALL BRANCHES.

Webb
Deuchars
Light
Giles
Le Maistre
White
Mills, J. C.
Weightman
Marjoribanks
Gardiner
Batten
Rennick
Hutton
Chirnside
Finnimore
Raven
O'Brien
Verschoyle*
Jackson
Scobie
Butcher
Pyne
Strachey
Maunsell
Phelps
Mackenzie
Buck
Tickell
Cox
Medlicott
Whiteley
Arnott
Kemball
Wildman-Lushington.*

TELEGRAPH DEPARTMENT.

Mathews
Lees
Smith, H. W.
Madge
Shaw, W. M.
Barker
Thomas
Foord, A. W.
Olphert
Kenyon
Hill, A. P.
Mallet

NOT PLACED.

Handcock, W. E. F.

* *Absent from part of Examination.*

† *Absent from First Year's Course.*

NINTH SESSION.

PRIZEMEN, ETC., JULY 1880.

APPOINTED FELLOWS OF COOPERS HILL.

DYSON, R. C. | ALEXANDER, E. J.

FELLOWS' SCHOLARSHIP.

Established by the Fellows of Coopers Hill.

ALEXANDER, E. J.

FOUNDATION SCHOLARS

In Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

Senior.	Junior.
CHIRNSIDE, J. B. BATTEN, S. G.	CLARK, C. C. S. TAYLOR, H.
Prox. Acc. WEIGHTMAN, W. J.	

Argyll Scholar in Natural Science.
MILLS, J. C.

Dickens Scholarship in Mathematics, given by Col. Hon. Sir A. Clarke, K.C.M.G., R.E.
WEBB, A. L.

Public Works Committee of the Council of India Scholar in Applied Mechanics.
DEUCHARS, G.

PRIZEMEN.

Accounts Prize, given by the Members of the Public Works Account Department, India.
ALEXANDER, E. J. | *Acc.* SWEET, G. W.

President's Prize for Indian History.
MARJORIBANKS, C. H. D.

	Third Year.	Second Year.	First Year.
Engineering	ALEXANDER, E. J.	CHIRNSIDE, J. B.	CARUS-WILSON, C. A.
Applied Mechanics	DYSON, R. C.	WEIGHTMAN, W. J.	TAYLOR, H.
Surveying			
Architecture		WEIGHTMAN, W. J.	
Project and Designs	ALEXANDER, E. J.		CARUS-WILSON, C. A.
Geometrical Drawing		BATTEN, S. G.	TAYLOR, H.
Do. 2nd	MAW, M. H.		
Freehand Drawing		BATTEN, S. G.	
Workshop Practice		CHIRNSIDE, J. B.	TAYLOR, H.
Estimating	CURRY, W. E.		CLARK, C. C. S.
Mathematics			*Prox. Acc.* ROWLAND, R. W.
Hindustani	PEARS, S. D.		DESPEISSIS, L. H.
Chemistry		MILLS, J. C.	
Geology		GARDINER, E. R.	
Hindustani			BARROW, W. D.
Indian History			BEALE, H. F.
			BARROW, W. D.
Gymnastics			WOOD, W. G.
			PYM, F. H.

Telegraph Department.
THOMAS, C. L.

256+37 = 293

NINTH SESSION.

PRIZEMEN, ETC., JULY 1880—*Co*

PASSED FOR THE INDIAN PUBLIC SE

As Assistant Engineers, Second Grade. (*Order*

Dyson, R. C., *E.C.M.*	Squire, S. N.	Norris, M. O.	Grant,
Alexander, E.J., *E.C.M.*	Shaw, W. R. *B. E.*	(*Provisionally.*)	Landon,
Manson, J.	Johns, W. A.	Sweet, G. W.	Mills, G
Maw, M. H.	Lee, E. A.	Strickland, H. J.	Maconch
Nethersole, M.	Guinness, H. S.	Scratchley, A.J.	Faulkne
Woollcombe, R.	Salter, E. G.	Johnston, H. J.	Smith,
Curry, W. E.	Perceval, R. D.	Carter, R. E.	LaTouch
Heath, A. V.			Sweet,

As Assistant Engineer, Third Grade.

Donnan, J.

As Assistant Superintendents, Telegraph Depar

Thomas, C. L. | Foord, A. W. | Kenyon, E. A. | Olphe

* Absent from part of the Examination

PASSED THE COLLEGE COURSE.

Yates, H. R. *Extra Student.*

HONOURS LIST.

THIRD YEAR.

BRANCH I. ENGINEERING.

FIRST CLASS.

Alexander
Dyson
Nethersole
Manson
Maw
Norris
Heath
Squire
Woollcombe
Perceval

SECOND CLASS.

Curry
Lee
Mills, G.
Strickland
Faulkner
Guinness
Maconchy
Graham
La Touche
Bowden
Johnston
Sweet, G. W.

THIRD CLASS.

Landon
Salter
Grant
Carter
Scratchley
Smith, C. A.

BRANCH II. MATHEMATICS.

FIRST CLASS.

Dyson
Alexander
Shaw, W. R. *B.E.*
Woollcombe
Manson
Johns

SECOND CLASS.

Jones
Curry
Maw

THIRD CLASS.

Heath
Guinness
Maconchy
Squire
Nethersole
Salter
Johnston
Scratchley
Sweet, G. W.
La Touche

BRANCH IV. HINDUSTANI AND INDIAN HI

FIRST CLASS.

Salter
Ash
Johns
Nethersole
Pears

SECOND CLASS.

Faulkner
Lee
Carter
Grant
Smith
Strickland
Landon
Sweet, G. W.
Blacker
Scratchley

THIRD CLASS.

Clerk
Heath
Curry
Dyson
Squire
Alexander
Sweet, W. McM.
Manson
Shaw, W. R.

NINTH SESSION.

PRIZEMEN, ETC., JULY 1880—*Continued.*

ANNUAL EXAMINATION.

SECOND YEAR.

BRANCH I. ENGINEERING.

Chirnside
Batten
Weightman
White
Deuchars
Mills, J. C.
Webb
Gardiner
Hutton
Le Maistre
Jackson
Light
Tickell
O'Brien
Strachey
Handcock, W. E. F.
Rennick
Whiteley
Verschoyle
Fym
Arnott
Medlicott
Buck
Marjoribanks
Finnimore
Scobie
Giles
Phelips
Handcock, G. F.
Raven
Mackenzie
Kemball
Maunsell
Cox

BRANCH II. MATHEMATICS.

Deuchars
Webb
Le Maistre
White
Weightman
Strachey
Marjoribanks
Light
Hutton
Medlicott
Handcock, W. E. F.
Fym
Batten
Gardiner
Verschoyle
Handcock, G. F.
Chirnside
Kemball
Mills, J. C.
Finnimore
Cox
O'Brien
Phelips
Rennick
Scobie
Tickell
Whiteley
Arnott
Giles
Maunsell
Raven
Buck
Jackson
Mackenzie

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

Marjoribanks
Giles
Scobie
Cox
Verschoyle
Finnimore
Raven
Light
Arnott
Hutton
Maunsell
Mackenzie
Phelips
O'Brien
Rennick
Kemball
Fym
Buck
Whiteley
Webb
Deuchars
Gardiner
Strachey
Jackson
White
Chirnside
Batten
Le Maistre
Mills, J. C.
Medlicott
Weightman
Handcock, G. F.
Handcock, W. E.
Tickell

ÆGROTAT.

Butcher

FIRST YEAR.

ORDER OF GENERAL MERIT. IN ALL BRANCHES.

Clark
Taylor
Douglass
*Carus-Wilson
Rowland
Beale
Despeissis
Barrow
Silk
Rushton
Wood, W. G.
Wylie
Rooper
Russell
Killick
Sanders
Barlow
Thomas, I. C.
Ashpitel
Phillips
Ali Akbar
Eve
Thompson
Le Pelley
Inglis
Walling
Lane-Fox
Wallace
Wood, C. W.
Allen
Harrison
Younghusband
Aitken

NOT PLACED.

Deveuish
McMillan
Shawe
Starky

* *Absent from part of Examination.*

TENTH SESSION.

PRIZEMEN, ETC., JULY 1881.

APPOINTED FELLOWS OF COOPERS HILL.

DEUCHARS, G. | WEBB, A. L.

FELLOWS' SCHOLARSHIP.

Established by the Fellows of Coopers Hill.

DEUCHARS, G.

FOUNDATION SCHOLARS

In Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

DYSON, S. P. H. (First Year Student). | BACON, H. M. J. (First Year Student).
TAYLOR, H. (Second Year Student).

Argyll Scholar in Natural Science.
CLARK, C. C. S. (Second Year Student).

Public Works Committee of the Council of India Scholar in Applied Mechanics.
WYLIE, G. (Second Year Student).

President's Scholar in Mathematics.
CARUS-WILSON, C. A. (Second Year Student).

PRIZEMEN.

Accounts Prize, given by the Members of the Public Works Account Department, India.
RENNICK, C. S. (Third Year Student).

Chesney Prize in Indian History.
BARROW, W. D. (Second Year Student).

	THIRD YEAR.	
Descriptive Engineering		CHIRNSIDE, J. B.
Applied Mechanics		DEUCHARS, G.
Project and Designs		WEBB, A. L.
Do. 2nd		DEUCHARS, G.
Estimating		TICKELL, R. H.
Hindustani		SCOBIE, D.

	SECOND YEAR.	FIRST YEAR.
Descriptive Engineering	CARUS-WILSON, C. A.	DYSON, S. P. H.
Surveying	TAYLOR, H.	DE PERROT, S.
Architecture	ROOPER, P. L.	
Geometrical Drawing	TAYLOR, H.	BACON, H. M. J.
Freehand Drawing	RUSSELL, R. P.	STARKY, W. B.
Workshop Practice	WYLIE, G.	DE PERROT, S.
Mathematics		DYSON, S. P. H.
Physics and Geology		HACKMAN, H. R.
Practical Chemistry	DESPEISSIS, L. H.	DEVENISH, J. A.
Hindustani	ALI AKBAR	DYSON, S. P. H.
Indian History		DEVENISH, J. A.
Gymnastics	WOOD, W. G.	

293 + 32 = 325

TENTH SESSION.

PRIZEMEN, ETC, JULY 1881—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Deuchars, G., *F.C.H.*	Gardiner, E. R.	Giles, W.	Arnott, M. H.
Webb, A. L., *F.C.H.*	Light, L. A.	Finnimore, B. K.	Phelips, H. V. M.
White, C. A.	Batten, S. G.	O'Brien, C. J.	Tickell, R. H.
Mills, J. C.	Strachey, R. S.	Rennick, C. S.	Whiteley, J. J.
Weightman, W. J.	Verschoyle, J. K. E.	Pym, F. H.	Kemball, H. V. R.
Hutton, C. H.	Marjoribanks, C. H. D.	Jackson, M. H.	Medlicott, J. H.
Chirnside, J. B.		Scobie, D. M.	Handcock, W. E. F.
Le Maistre, G. H.			

Buck, R. D.	
Maunsell, F. W.	
Raven, P. E.	
Cox, S.	
Non-resident Student.	
Drew, W.	

As Assistant Engineers, Third Grade.

Mackenzie, A. T. | Handcock, G. F.

As Assistant Superintendent, Telegraph Department.

Thomas, I. C.

HONOURS LIST.

THIRD YEAR.

SECOND YEAR.

BRANCH I. ENGINEERING.

FIRST CLASS.

Chirnside
Weightman
Deuchars
Webb
White
Mills

SECOND CLASS.

Batten
Gardine
Hutton

THIRD CLASS.

Le Maistre
Light
Strachey
Tickell
Jackson
O'Brien
Rennick

BRANCH II. MATHEMATICS.

FIRST CLASS.

Deuchars
Webb
White
Le Maistre

SECOND CLASS.

Weightman
Strachey
Hutton
Light
Marjoribanks
Medlicott

THIRD CLASS.

Verschoyle
Handcock, W. E. F.
Mills
Handcock, G. F.
Kemball
Pym
Arnott
Gardiner

BRANCH IV. HINDUSTANI AND INDIAN HISTORY.

FIRST CLASS.

Giles
Marjoribanks
Scobie
Cox

SECOND CLASS.

Verschoyle
Finnimore
Mackenzie
Raven

THIRD CLASS.

Light
Maunsell
Hutton
Arnott
Phelips
Rennick
Kemball
O'Brien
Pym
Webb
Buck
Whiteley
Deuchars
White
Strachey
Gardiner

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Clark
Despeissis
Taylor

SECOND CLASS.

Le Pelley
Russell
Phillips

THIRD CLASS.

Inglis
Thompson
Silk
Wood, C. W.
Wylie
Killick
Eve
Harrison
Carus-Wilson
Douglass
Sanders

TENTH SESSION.

PRIZEMEN, ETC., JULY 1881—*Continued.*

ANNUAL EXAMINATION.

SECOND YEAR.

BRANCH I. ENGINEERING.

Carus-Wilson
Taylor
Douglass
Despeissis
Russell
Rushton
Eve
Wylie
Rooper
Barlow, Silk
Sanders
Wood, W. G.
Beale, Clark
Ashpitel
Barrow
Allen
Killick
Wallace
Walling
Aitken
Butcher
Le Pelley, Rowland, R. W., Younghusband
Phillips
Inglis
Harrison
Thompson
Wood, C. W.
Lane-Fox-Pitt
Ali Akbar

BRANCH II. MATHEMATICS.

Wylie
Carus-Wilson
Clarke, Rowland, R. W.
Sanders
Barrow
Douglass, Silk, Taylor
Le Pelley, Rooper
Beale
Barlow, Despeissis
Ashpitel
Ali Akbar, Phillips
Wood, C. W.
Russell
Eve, Harrison, Inglis, Rushton, Wood, W. G.
Allen
Lane-Fox-Pitt, Wallace, Butcher, Killick
Walling

NOT PLACED.

Thompson
Younghusband
Aitken

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

Barrow
Beale
Ali Akbar
Inglis
Douglass, Rushton, Walling, Rooper, Rowland, R. W.
Wood, W. G.
Barlow, Butcher, Phillips, Silk
Wood, C. W.
Clark
Ashpitel, Taylor, Thompson, Younghusband
Carus-Wilson, Despeissis, Sanders
Le Pelley, Wallace, Russell, Wylie

NOT PLACED.

Aitken
Allen
Eve
Harrison
Killick
Lane-Fox-Pitt

FIRST YEAR.

ORDER OF GENERAL MERIT. IN ALL BRANCHES.

Dyson
Bacon
Devenish, Jones, C. E. A.
Hackman
Starky
Orr
Ward
Pellereau, De Perrot
Bonhote
McMillan
Green
Eaton, Rowland, A.
Jones, H. S.

ÆGROTAT.

Clowes

NOT PLACED.

Appleby
Del Monte
Leake
Napier
Robinson

TELEGRAPH DEPARTMENT.

Styan
Elrington

ELEVENTH SESSION.

ANNUAL EXAMINATIONS, 1882.

APPOINTED FELLOWS OF COOPERS HILL.

WYLIE, G. | TAYLOR, H. B.

SCHOLARSHIPS.

THIRD YEAR STUDENT.

FELLOWS' SCHOLAR.

WYLIE, G.

Scholarship established by the Fellows of Coopers Hill.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR

In Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

BACON, H. M. J.

Argyll Scholar in Natural Science.

Scholarship given by the Marquis of Hartington, Secretary of State for India.

HACKMAN, H. R.

Public Works Committee of the Council of India Scholar in Applied Mechanics.

DYSON, S. P. H.

President's Scholar in Mathematics.

ORR, A. E.

PRIZEMEN.

Accounts Prize, given by the Members of the Public Works Account Department, India.

LE PELLEY, E. B. (Third Year Student).

	THIRD YEAR.	
Descriptive Engineering	WYLIE, G.	
Applied Mechanics	WYLIE, G.	
Project and Designs	TAYLOR, H. B.	
Do. 2nd	BEALE, H. F.	
Estimating	WYLIE, G.	
Gymnastics	WOOD, W. G.	

	SECOND YEAR.	FIRST YEAR.
Descriptive Engineering	DYSON, S. P. H.	BOWER, P. H.
	acc. DE PERROT, S.	
Surveying	DYSON, S. P. H.	ROBERTS, C.
Do. 2nd	DE PERROT, S.	
Architecture	DYSON, S. P. H.	
Geometrical Drawing	CLOWES, T. H.	ROBERTS, C.
Freehand Drawing	CLOWES, T. H.	SHEPARD, A. W.
Workshop Practice	DE PERROT, S.	ROBERTS, C.
	acc. BACON, H. M. J.	*acc.* BOWER, P. H.
Mathematics	. . . . .	SYKES, C. F.
Chemistry	DYSON, S. P. H.	SHEPARD, A. W.
		prox. acc. ROBERTS, C.
Geology	. . . . .	SYKES, C. F.

ELEVENTH SESSION.

ANNUAL EXAMINATIONS, 1882—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Wylie, G., *F.C.H.*	Beale, H. F.	Rowland, R. W.	Phillips, H.	Ali Akbar
Douglass, R.	Sanders, H. C.	Rushton, W. H.	Ashpitel, F. W.	Butcher, L. H.
Taylor, H. B., *F.C.H.*	Silk, A. E.	Barlow, H.	Inglis, J.	Wallace, J. A. A.
Clark, C. C. S.	Rooper, P. L.	Eve, J. F. S.	le Pelley, E. B.	Thompson, G. F.
Barrow, W. D.	Russell, R. P.	Wood, W. G.	Killick, C. S.	Walling, H. O.

As Assistant Engineers, Third Grade.

Wood, C. W.	Harrison, G. McC.
Allen, P. R.	Younghusband, A.

Passed the College Course.

Despeissis, L. H., *Extra Student.*

As Assistant Superintendents, Telegraph Department.

Styan, H. S.	Elrington, R.

HONOURS LIST.

THIRD YEAR.

BRANCH I. ENGINEERING.

FIRST CLASS.

Taylor
Douglass
Russell
Wylie

SECOND CLASS.

Despeissis, L. H.
Rooper
Rushton
Silk
Beale
Sanders
Clark
Eve

THIRD CLASS.

Barrow
Ashpitel
Barlow
Wood, W. G.
Killick
Wallace
Walling
Allen
Butcher
le Pelley

BRANCH II. MATHEMATICS.

FIRST CLASS.

Wylie
Clark
Barrow

SECOND CLASS.

Douglass
Rowland, R. W.
Sanders
Taylor
Silk
Beale

THIRD CLASS.

Despeissis, L. H.
Phillips
Barlow
le Pelley
Rooper
Ali Akbar

BRANCH IV. HINDUSTANI AND INDIAN HISTORY.

FIRST CLASS.

Barrow
Beale
Ali Akbar

SECOND CLASS.

Inglis
Douglass
Rushton

THIRD CLASS.

Walling
Rooper
Rowland, R. W.
Wood, W. G.
Barlow
Butcher
Phillips
Silk
Wood, C. W.
Clark

SECOND YEAR.

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Hackman
Devenish
Bacon

SECOND CLASS.

Ward
Dyson

THIRD CLASS.

Bonhote
Green
Pellereau
Eaton

NOT PLACED.

del Monte
Leake

ELEVENTH SESSION.

PRIZEMEN, ETC., JULY 1882—*Continued.*

ANNUAL EXAMINATION.

SECOND YEAR.

BRANCH I. ENGINEERING.

Bacon
de Perrot
Jones, C. E.
Dyson
Ward
Bonhote
Clowes
Orr
Starky
Hackman
Leake
Rowland, A.
Jones, H. S.
Macmillan
Eaton
Pellereau
Devenish
del Monte
Napier
Green

BRANCH II. MATHEMATICS.

Dyson
Bacon
Orr
Pellereau
Hackman
Jones, C. E.
Napier
Green
Ward
Starky
Rowland, A.
Bonhote
Jones, H. S.
Macmillan
Clowes
Eaton
Devenish
de Perrot

NOT PLACED.

del Monte
Leake

BRANCH IV. HINDUSTANI & INDIAN HISTORY.

Dyson
Devenish
Hackman
Jones, C. E. A.
Starky
Macmillan
Bacon
Ward
Orr
Bonhote
Pellereau
Green
Rowland, A.
de Perrot
Jones, H. S.
Eaton
del Monte
Leake
Napier
Clowes

FIRST YEAR.

ORDER OF GENERAL MERIT. IN ALL BRANCHES.

Sykes
Bower
Roberts
Despeissis, J. M.
Wildeblood
John
Robertson, L. F.
Polwhele
Long
Sprott
Murray
Hewitt
Knowles
Randabel
Shawe
Smith
Waddell
Chappel
Shepard
Wackrill
Stawell
Searight
Broun
Burton
Minchin
Chambers
Reeves
Thornhill

NOT PLACED.

Acton
Burne
Egerton
Evered
Harrison, W. A.
Robertson, D.

TWELFTH SESSION.

ANNUAL EXAMINATIONS, JULY 1883.

APPOINTED FELLOWS OF COOPERS HILL.

DYSON, S. P. H. | BACON, H. M. J.

SCHOLARSHIPS.

THIRD YEAR STUDENT.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill

DYSON, S. P. H.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

ROBERTS, C.

Argyll Scholar in Natural Science.

Scholarship given by the Earl of Kimberley, Secretary of State for India.

*[ROBERTS, C.] | BOWER, P. H.

Chesney Scholar in Mathematics.

*[SYKES, C. F.] | DESPEISSIS, J. M. A.

President's Scholar in Applied Mechanics.

SYKES, C. F.

FIRST YEAR STUDENT.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

GRANT, F.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE	*in Accounts, given by the Members of the Public Works Account Department, India*	DYSON, S. P. H.
"	*Descriptive Engineering*	DYSON, S. P. H.
"	*Applied Mechanics*	DYSON, S. P. H.
"	*Project and Designs*	BACON, H. M. J.
"	*Do. 2nd*	DYSON, S. P. H.
"	*Estimating*	WARD, T. R. J.

		SECOND YEAR STUDENTS.	FIRST YEAR STUDENTS.
PRIZE	*in Descriptive Engineering*	BOWER, P. H.	ADAM, J.
"	*Surveying*	ROBERTS, C.	ADAM, J.
"	*Architecture*	ROBERTS, C.	
"	*Geometrical Drawing*	ROBERTS, C.	ADAM, J.
"	*Freehand Drawing*	SHEPARD, A. W.	EGERTON, C. F. A.
"	*Workshop Practice*	ROBERTS, C.	BURNE, O.
"	*Physics*	SHEPARD, A. W.	MOSS, H. A.
"	*Geology*	ROBERTS, C. SYKES, C. F.	MERCER, F.
"	*Practical Chemistry*	BOWER, P. H.	
"	*Mathematics*		GRANT, F.
"	*Do. 2nd*		KIRBY, N.
"	*Gymnastics*	KNOWLES, W.	

* Disqualified by the rule precluding a Student from holding more than one Scholarship.

350 + 16 = 366

TWELFTH SESSION.

ANNUAL EXAMINATIONS, JULY 1883—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order of Merit.*)

Dyson, S. P. H., *F.C.H.*	Hackman, H. R.	Starky, W. B.	MacMillan, H.
Bacon, H. M. J., *F.C.H.*	Orr, A. E.	Clowes, T. H.	Rowland, A.
Ward, T. R. J.	Pellereau, H. E.	Green, H. H.	Napier, Hon. E.H.S.
Jones, C. E. A.	Devenish, J. A.	Jones, H. S.	Eaton, J. N. A.

As Assistant Superintendents, Telegraph Department.

Chappel, H. E. | Shawe, A. E.

HONOURS LIST, 1883.

THIRD YEAR.

BRANCH I. ENGINEERING.

FIRST CLASS.

Bacon
Dyson

SECOND CLASS.

Ward
Jones, C. E. A.
Clowes
Starky
Orr

THIRD CLASS.

Hackman
Pellereau
Jones, H. S.

BRANCH II. MATHEMATICS.

FIRST CLASS.

Dyson
Bacon

SECOND CLASS.

Orr
Pellereau
Ward

THIRD CLASS.

Hackman
Jones, C. E. A.
Green

NOT PLACED.

del Monte

SECOND YEAR.

BRANCH III. NATURAL SCIENCE.

FIRST CLASS.

Roberts
Bower
Shepard
Wildeblood

SECOND CLASS.

Sprott
Polwhele
Robertson, L. F.
Smith

THIRD CLASS.

Randabel
Hewitt
Sykes
Burton
Murray
Waddell
Despeissis
Long
Searight
Broun
Knowles
Stawell

NOT PLACED.

Chambers

TWELFTH SESSION.

PRIZEMEN, ETC., JULY 1883—*Continued.*

ANNUAL EXAMINATION.

SECOND YEAR.		FIRST YEAR.
BRANCH I. **ENGINEERING.**	BRANCH II. **MATHEMATICS.**	ORDER IN GENERAL MERIT.
Roberts	Sykes	Grant
Bower	Despeissis	Croft
Sykes	Bower	Adam
Long	John, Wildeblood	Kirby
Polwhele	Roberts	Aikman, Scovell
Robertson, L. F.	Polwhele	Wilson, F. A.
Wildeblood	Stawell	Nathan
Knowles	Smith	Trewhella
Searight	Robertson, L. F.	Picton-Jones, Robinson
Smith	Hewitt	Gilliland
Broun	Long	Burne
Despeissis	Murray, Sprott	Wilson, J. S.
Sprott	Wackrill, Reeves, Shepard	Egerton, Mercer, Moss
Murray	Chambers	Barnes, Beresford
Shepard, Wackrill, Waddell	Randabel	Chapman, A. E., Gillon
Minchin	Burton	Lyle
John, Randabel, Stawell	Knowles	Massy-Westropp
Burton	Waddell	Carne
Hewitt	Searight	Thornhill
Reeves	Broun	Radcliffe
		Newton
		Mackail
		Yorke
		Robertson, D.
		Pereira
		Lavelle
NOT PLACED.	**NOT PLACED.**	**NOT PLACED.**
Chambers	Minchin	Chapman, C. P.
		Harris
		Harrison
		Keppel
		Lewis
		Melvill
		Thomasen
		Wrey

THIRTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1884.

APPOINTED FELLOWS OF COOPERS HILL.

ROBERTS, C. | SYKES, C. F. | BOWER, P. H.

SCHOLARSHIPS.

THIRD YEAR STUDENT.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill.

ROBERTS, C.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

ADAM, J.

Argyll Scholar in Natural Science.

Scholarship given by the Earl of Kimberley, Secretary of State for India.

CROFT, J. F.

Chesney Scholar in Mathematics.

KIRBY, N.

President's Scholar in Applied Mechanics.

GRANT, F.

FIRST YEAR STUDENT.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

GALES, R. R.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE in *Accounts, given by the Members of the Public Works Account Department, India* — ROBERTS, C.
" *Descriptive Engineering* — ROBERTS, C.
" *Applied Mechanics* — SYKES, C. F.
" *Designs, given by H. Marsh, Esq., P.W.D.* — BOWER, P. H.
" *Project* — ROBERTS, C.
" *Estimating* — ROBERTS, C.
" *Gymnastics* — KNOWLES, W.
" *Mechanical Laboratory* — BOWER, P. H.

	SECOND YEAR STUDENTS.	FIRST YEAR STUDENTS.
PRIZE in *Descriptive Engineering*	ADAM, J.	GALES, R. R. REILLY, F.
" *Surveying*	ADAM, J.	GALES, R. R.
" *Architecture*	BERESFORD, G. C.	
" *Geometrical Drawing*	ADAM, J.	GALES, R. R.
" *Freehand Drawing*		ROUCH, A. B.
" *Workshop Practice*	WILSON, J. S.	COUCHMAN, F. D.
" *Mathematics*		GALES, R. R.
" *Chemistry*		GALES, R. R.
" *Geology*	SCOVELL, C. T. R.	GALES, R. R. ROUCH, A. B.
" *Physics*		GALES, R. R.
" *Physical Laboratory*	SCOVELL, C. T. R.	
" *Chemical Laboratory*	YORKE, R. H.	CODDE, J. M. GALES, R. R.

366+13 = 379

THIRTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1884—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Roberts, C., *F.C.H.*
Sykes, C. F., *F.C.H.*
Despeissis, J. M.
Wildeblood, H. S.
Polwhele, A. C.
Smith, J. H. M.
Robertson, L. F.
Long, J. S. L.
John, H. C. R.
Sprott, F. L.
Stawell, G. C.
Murray, S. B.
Knowles, W.

As Assistant Superintendents, Telegraph Department.

Burne, O.
Mercer, F.

PASSED LIST, 1884.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. ENGINEERING.	BRANCH II. MATHEMATICS.	BRANCH III. NATURAL SCIENCE.
	FIRST CLASS.	**FIRST CLASS.**	**FIRST CLASS.**
Roberts, C.	Roberts	Sykes	Bower
Sykes, C. F.	Bower	Despeissis	Wildeblood
Bower, P. H.	Long	Bower	Polwhele, Shepard
Despeissis, J. M.	Robertson	Roberts	
Wildeblood, H. S.	Sykes	Wildeblood	
Polwhele, A. C.		John	
Smith, J. H. M.			
Robertson, L. F.			
Long, J. S. L.			
John, H. R. C.			
Sprott, F. L.			
Stawell, G. C.			
Murray, S. B.			
Knowles, W.			
	SECOND CLASS.	**SECOND CLASS.**	**SECOND CLASS.**
*Searight, G. L.	Knowles	Polwhele	Hewitt, Sykes, Roberts, Sprott
*Shepard, A. W.	Polwhele	Smith	Smith, Despeissis, Burton, Robertson
*Hewitt, J. C.	Searight	Stawell	Randabel, Stawell, Murray, Waddell
*Broun, A. H.	Murray	Robertson	Long, Searight, Broun, John
Wackrill, A. E.	Smith, Wildeblood	Long	Knowles, Chambers, Reeves, Wackrill
Waddell, G.	Broun	Sprott	
Randabel, P.	Sprott	Murray	
Burton, J. H.	Despeissis, Stawell	Shepard	
Reeves, E. J.	Waddell	Hewitt, Reeves, Wackrill	
Chambers, C.	Wackrill	Chambers	
	John	Knowles	
	Randabel	Burton	
	Burton, Reeves, Shepard	Randabel	
	Hewitt	Waddell	
	Chambers	Searight	
		Broun	

TELEGRAPH COURSE.

Burne, O.
Mercer, F.
Yorke, R. F.

First Class Students hold a Diploma of Associate of Coopers Hill. Second Class and Telegraph Course Students hold a Diploma of Qualification.

* Messrs. Searight, Shepard, Hewitt, and Broun received appointments as Assistant Engineers, Second Grade, in 1886, to replace those who received commissions in the Royal Engineers.

THIRTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1884—*Continued.*

ORDER IN MERIT.

SECOND YEAR.			FIRST YEAR.
BRANCH I. ENGINEERING.	BRANCH II. MATHEMATICS.	BRANCH III. NATURAL SCIENCE.	ORDER IN GENERAL MERIT.
Adam	Grant	Croft	Gales
Scovell	Kirby	Nathan	Woodside
Robinson	Wilson, F. A.	Kirby, Trewhella	Fowler
Wilson, J. S.	Croft	Thornhill	Cuming
Nathan	Picton-Jones	Aikman	Paul
Picton-Jones	Adam	Grant	Yeoman
Barnes, Egerton	Scovell	Wilson, F. A.	Ronch
Moss, Wilson, F. A.	Lyle	Scovell	Cleaver
Chapman, Radcliffe, Trewhella	Aikman	Carne, Moss, Gilliland, Gillon	Rose, Stanley
Beresford, Gillon, Kirby	Trewhella	Wilson, J. S.	Coode
Newton	Gilliland	Massy-Westropp, Picton-Jones	Wickham, H.
Croft, Gilliland, Massy-Westropp	Nathan	Robinson	Grimes
Carne	Robinson	Chapman	Couchman
Aikman	Carne	Adam, Barnes, Egerton, Beresford, Thomason	Barlow
Thornhill	Gillon	Radcliffe	Reilly
Lyle, Pereira, Thomason	Moss	Mackail	Weldon
Mackail	Barnes, Beresford	Lyle, Pereira	Keir
Grant	Pereira	Newton	MacCarthy
Robertson	Radcliffe	Harrison, Robertson	Eldridge
Harrison	Wilson, J. S.		Morgan
	Mackail		Proctor
	Chapman, Massy-Westropp		Jacobs
	Thomason		Moreton
	Newton		Gibbs
	Thornhill		Wickham, L. L.
	Harrison		Smyth
	Egerton		Loam
	Robertson		Grey
			Wrey
			Putz
			Keppel
			Blackett
			Combe, Milne
			Strang
			Bundock

FOURTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1885.

APPOINTED FELLOWS OF COOPERS HILL.

ADAM, J. | GRANT, F.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill.

ADAM, J.

Argyll Scholar in Natural Science.

Scholarship given by the Secretary of State for India.

NATHAN, W.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

*(GALES, R. R.) PAUL, E. M.

Chesney Scholar in Mathematics.

*(GALES, R. R.) CUMING, J. H.

President's Scholar in Applied Mechanics.

GALES, R. R. *prox. acc.* COUCHMAN, F. D.

FIRST YEAR STUDENT.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

FRASER, H. A. D.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE *in Accounts, given by the Members of the Public Works Account Department, India* — AIKMAN, D. W.

" *Descriptive Engineering* . . . . . ADAM, J.

" *Applied Mechanics* . . . . . GRANT, F.

" *Project and Designs—First Prize* . . ADAM, J.

" " *Second Prize* . . SCOVELL, C. T. R.

" *Estimating* . . . . . ADAM, J.

" *Gymnastics* . . . . . KIRBY, N.

	SECOND YEAR STUDENTS.	FIRST YEAR STUDENTS.
PRIZE *in Descriptive Engineering* .	PAUL, E. M. .	FRASER, H. A. D.
" *Surveying*	GALES, R. R. .	CURRIE, H. A. F.
" *Architecture* . . .	ROUCH, A. B. .	.
" *Geometrical Drawing* .	GALES, R. R. .	FRASER, H. A. D.
" *Freehand Drawing* . .		TRAPMANN, A. G. R.
" *Workshop Practice* . .	STANLEY, E. G.	STANTON, J. C.
" *Mathematics* . . .		SHORTT, A. G., B. A.
" *Applied Mechanics* . .	COUCHMAN, F. D.	.
" *Chemistry*		FRASER, H. A. D.
" *Geology*	ROUCH, A. B. .	FRASER, H. A. D. / KEELING, H. T.
" *Physics*	ROUCH, A. B. .	FRASER, H. A. D.
" *Physical Laboratory* . .	PAUL, E. M. .	.
" *Chemical Laboratory* . .	ROUCH, A. B. .	FRASER, H. A. D.

* Disqualified by the rule precluding a Student from holding more than one Scholarship.

379+18 = 397

FOURTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1885—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (Order in Merit.)

Adam, J., *F.C.H.*
Grant, F., *F.C.H.*
Scovell, C. T. R.
†Wilson, F. A.
†Picton-Jones, R. E.
†Kirby, N.
**Trewhella, C. R.*
Nathan, W.
†Robinson, R. P.
Moss, H. A.
Carne, F. W.
Aikman, D. W.
Gilliland, P. W.
Lyle, J. C.
Wilson, J. S.
Barnes, R.
**Beresford, G. C.*
**Pereira, A. C.*

As Assistant Superintendents, Telegraph Department.

Coode, J. M. | Grimes, A. J. L.

PASSED LIST, 1885.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
Adam, J. Grant, F. Scovell, C. T. R. Wilson, F. A. Picton-Jones, R. E. Kirby, N. Trewhella, C. R. Nathan, W. Robinson, R. P. Moss, H. A. Carne, F. W. Aikman, D. W. Gilliland, P. W. Lyle, J. C. Wilson, J. S. Barnes, R. Beresford, G. C. Pereira, A. C. Radcliffe, P. J. J. Thornhill, B. Gillon, D. J. Chapman, A. E. Thomason, R. M. Mackail, G. H. Massy-Westropp, R. H.	**FIRST CLASS.** Adam, J. Scovell, C. T. R. Robinson, R. P. Picton-Jones, R. E. **SECOND CLASS.** Wilson, J. S. Wilson, F. A. Nathan Radcliffe Trewhella Beresford Moss Barnes Chapman Thomason Carne Thornhill Gilliland Pereira Kirby Aikman Mackail Massy-Westropp Gillon Grant Lyle	**FIRST CLASS.** Grant, F. Wilson, F. A. Picton-Jones, R. E. **SECOND CLASS.** Trewhella Kirby Adam Scovell Lyle Nathan Gilliland Carne Moss Robinson Aikman Barnes Beresford Pereira Wilson, J. S. Thomason Chapman Radcliffe Gillon Mackail Thornhill Massy-Westropp	**FIRST CLASS.** Grant, F. **SECOND CLASS.** Kirby Wilson, F. A. Picton-Jones Adam Aikman Lyle Trewhella Scovell Nathan Gilliland Robinson Gillon Carne Pereira Moss Barnes Beresford Mackail Chapman Massy-Westropp Radcliffe Wilson, J. S. Thomason Thornhill	**FIRST CLASS.** Nathan, W. Kirby, N. Trewhella, C. R. Grant, F. **SECOND CLASS.** Aikman Carne Gillon Moss Gilliland Thornhill Wilson, F. A. Scovell Pereira Barnes Wilson, J. S. Mackail Massy-Westropp Picton-Jones Robinson Lyle Chapman Adam Beresford Thomason Radcliffe

TELEGRAPH COURSE.

Coode, J. M. | Grimes, A. J. L.

First Class Students hold the Diploma of Associate of Coopers Hill. Second Class and Telegraph Students hold the Diploma of Qualification.

* Mr. Trewhella declined the appointment, and Mr. Beresford was taken in his place, Mr. Pereira having been disqualified at the first medical examination, although he too was subsequently accepted.

Messrs. Wilson, Picton-Jones, Kirby, Robinson, and Radcliffe, and also Messrs. Fowler, Paul, and Rouch of the next Junior Year, received Commissions in the Royal Engineers in 1886.

FOURTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1885—*Continued.*

ORDER IN MERIT.

SECOND YEAR.				FIRST YEAR.
BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.	ORDER IN GENERAL MERIT.
Gales	Gales	**FIRST CLASS.**	Rouch	Fraser, H. A. D.
†Paul	Couchman	Gales	Gales	Young
†Rouch	Fowler	Cuming	Yeoman	Currie
Stanley	Rose		Cleaver	Shortt
Reilly	Cuming		Rose	Eldridge
Yeoman	Yeoman		Barlow	Herbert
Woodside	Rouch	**SECOND CLASS.**	Fowler	Loring
Cuming	Paul		Paul	Gale
Couchman	Woodside	Fowler	Woodside	Tayler
Rose	Weldon	Paul	Weldon	Williams
Weldon	Barlow	Woodside	Morgan	Goodall
Barlow	Jacobs	Yeoman	Reilly	Mawson
†Fowler	Reilly	Rose	Cuming	Heaton
Cleaver	Stanley	Rouch	Couchman	MacCarthy
Wickham, L. L.	Cleaver	Couchman	Loam	Stanton
Morgan	Smyth	Barlow	Stanley	Trapmann
Jacobs	Wickham, L. L.	Stanley	Jacobs	Dove Wilson
Loam	Loam	Jacobs	Wickham, L. L.	Gibbs
Smyth	Morgan	Weldon	Smyth	Keeling
		Cleaver		Jones
		Morgan		Western
		Reilly		Moreton
		Smyth		Langlands
		Wickham, L. L.		Mildred
		Loam		Godden
				Staples
				Clarke
				Carr
				Doughty
				Core
				Blackett
				Combe
				Irvine
				Ellis
				Milne
				Watts
				Armstrong
				Thompson
				Carleton
				Kenyon
				Fraser, G. W.
				Hobart-Hampden

† See note on last page.

FIFTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1886.

APPOINTED FELLOWS OF COOPERS HILL.

GALES, R. R. | CUMING, J. H.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

Argyll Scholar in Natural Science.

Scholarship given by the Earl of Kimberley, Secretary of State for India.

GALES, R. R. *prox. acc.* YEOMAN, F. W. K.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill.

CUMING, J. H.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

WILLIAMS, W. R.

Chesney Scholar in Mathematics.

*(CURRIE, H. A. F.) YOUNG, E. H.

President's Scholar in Applied Mechanics.

CURRIE, H. A. F.

FIRST YEAR STUDENT.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

CLAYTON, F.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE *in Accounts, given by the Members of the Public Works Account Department, India* — GALES, R. R.

" *Descriptive Engineering* — REILLY, F. / STANLEY, E. G.

" *Applied Mechanics* — CUMING, J. H.

" *Project and Designs—First Prize* — REILLY, F.

" " *Second Prize* — YEOMAN, F. W. K.

" *Estimating* — YEOMAN, F. W. K.

" *Gymnastics* — LOAM, M.

	SECOND YEAR STUDENTS.	FIRST YEAR STUDENTS
PRIZE *in Descriptive Engineering*	WILLIAMS, W. R.	DUFUIS, C.E., B.A
" *Surveying*	WILSON, C. D. D.	CLAYTON, F.
" *Architecture*	YOUNG, E. H.	
" *Geometrical Drawing*	YOUNG, E. H.	SMITH-AINSLEY, B.E.
" *Freehand Drawing*		HILL, M.
" *Workshop Practice*	STANTON, J. C.	LLOYD, C. V.
" *Mathematics*		CLAYTON, F.
" *Chemistry*		BUDHBHATTI, K.S.
" *Geology*	ELDRIDGE, H. J.	COX, F. N.
" *Physics*	STANTON, J. C. / WESTERN, R. W.	DUFUIS, C.E., B.A.
" *Physical Laboratory*	WILLIAMS, W. R.	
" *Chemical Laboratory*		DUFUIS, C.E., B.A.
" *General Merit, Forestry Course*		ROGERS, C. G.

* Disqualified by the rule precluding a Student from holding more than one Scholarship.

FIFTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1886—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Gales, R. R., *F.C.H.*
Cuming, J. H., *F.C.H.*
Woodside, J.
Yeoman, F. W. K.
Rose, F. C.
Barlow, G. T.
Couchman, F. D.
Reilly, Francis.
Stanley, E. G.
Weldon, H. N.
Cleaver, H. L.
Jacobs, P. G.
Wickham, L. L.
Smyth, T. W. S.
Loam, M.

As Assistant Superintendents, Telegraph Department.

Goodall, H. C. A. | Gibbs, R. T.

PASSED LIST, 1886.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
Gales, R. R. Cuming, J. H. Woodside, J. Yeoman, F. W. K. Rose, F. C. Barlow, G. T. Couchman, F. D. Reilly, F. Stanley, E. G. Weldon, H. N. Cleaver, H. L. Jacobs, P. G. Wickham, L. L. Smyth, T. W. S. Loam, M. Morgan, W. H.	**FIRST CLASS.** Reilly Stanley Woodside Gales Yeoman	**FIRST CLASS.** Cuming Gales Rose Couchman	**FIRST CLASS.** Gales Cuming	**FIRST CLASS.** Gales Yeoman Rose Barlow Weldon
	SECOND CLASS. Cuming Rose Barlow Weldon Couchman Cleaver Wickham Jacobs Loam Smyth Morgan	**SECOND CLASS.** Woodside Yeoman Barlow Jacobs Smyth Weldon Cleaver Stanley Reilly Wickham Loam Morgan	**SECOND CLASS.** Woodside Yeoman Rose Couchman Barlow Stanley Jacobs Weldon Cleaver Morgan Reilly Smyth Wickham Loam	**SECOND CLASS.** Cleaver Cuming Loam Couchman Morgan Woodside Reilly Jacobs Stanley Smyth Wickham
RE-EXAMINED FROM PREVIOUS YEAR. Egerton, C. F. Robertson, D.		*FROM PREVIOUS YEAR.* Egerton Robertson		

TELEGRAPH COURSE.

Goodall, H. C. A. | Gibbs, R. T.

First Class Students hold the Diploma of Associate of Coopers Hill. Second Class, Telegraph, and the two re-examined Students hold the Diploma of Qualification.

394+15 = 412

FIFTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1886—*Continued.*

ORDER IN MERIT.

SECOND YEAR.					FIRST YEAR.
ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.	ORDER IN GENERAL MERIT.
Currie, H. A. F. Williams, W. R. Young, E. H. Gale, A. B. Eldridge, H. J. Herbert, E. C. Tayler, F. V. Wilson, C. D. D. Western, R. W. Heaton, B. Mawson, E. O. MacCarthy, A. H. C. Stanton, J. C. Keeling, H. T. Trapmann, A. G. R. Jones, H. C. Mildred, C. Clarke, F. P. S. Moreton, E. C. Langlands, A. W. Staples, S. F. Godden, H. L. Irvine, H. A. Thompson, E. Blackett, J. C. Milne, C. L. Watts, A. M. S. Hobart-Hampden, A. E.	Williams Herbert Stanton Currie Eldridge Wilson Young Gale Heaton Tayler Keeling Mawson Mildred Western Moreton Trapmann MacCarthy Jones Clarke Godden Langlands Thompson Staples Blackett Milne Irvine Watts Hobart-Hampden	Currie Williams Western Gale Herbert Eldridge Young Clarke Keeling Tayler Wilson Mildred Heaton Jones MacCarthy Mawson Trapmann Moreton Langlands Stanton Staples Godden Blackett Irvine Thompson Milne Hobart-Hampden Watts	**FIRST CLASS.** Currie Young — **SECOND CLASS.** Williams Tayler Gale Eldridge MacCarthy Jones Trapmann Wilson Western Heaton Mawson Herbert Langlands Mildred Clarke Keeling Moreton Stanton Staples Godden Irvine Thompson	Eldridge Gale Herbert MacCarthy Currie Young Godden Western Jones Williams Stanton Clarke Wilson Heaton Keeling Staples Mawson Langlands Trapmann Moreton Tayler Watts Irvine Milne Mildred Thompson Blackett Hobart-Hampden	Clayton, F. Dupuis, C. E., *B.A.* Bell, E. A. S. Howard, W. H. K. Pitot, L. E. Meyer, J. L. Smith - Ainsley, B. E. Cox, F. N. Sutherland, J. Gabbett, E. Gregory, J. M. Simpson, M. G. Bull, F. E. Lloyd, C. Y. Holins, W. F. Eidont, J. B. M. Mahon, G. Sen, P. N. Budhbhatti, K. S. Lugard, E. A. Baines, H. M. Bader, F. R. Court, R. F. Howley, W. J. Wright, F. J. Buscarlet, F. C. Marriott, D. Coxe, R. K. Bowker, J. A. Campbell, A. G. Doughty, G. C. Hudson, E. J. B. Smith, O. S. Henderson, W. P. Cradock, A. J. Romilly, A. G. Wade, E. H. *Cather, G. F. O'Donoghue, F. H. Cape, G. A. S. Ellis, J. S. H. Cumming, E. A. Pocklington, F. A. Yonge, M. E. Hill, C. E. Couper, J. C. O. Johnson, G. W. William, W. A. Fraser, G. W. *FOREST STUDENTS.* Rogers, C. G. Hart, G. S. Hill, M. O'Bryen, E. A. Oliver, E. G.

* Absent from part of Examination

SIXTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1887.

APPOINTED FELLOWS OF COOPERS HILL.

CURRIE, H. A. F. | WILLIAMS, W. R.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

Argyll Scholar in Natural Science.

Scholarship given by Viscount Cross, Secretary of State for India.

GALE, A. B.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill.

CURRIE, H. A. F.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

SMITH-AINSLEY, B. E.

Chesney Scholar in Mathematics.

CLAYTON, F.

President's Scholar in Applied Mechanics.

BELL, E. A. S., *prox. acc.* CLAYTON, F.

FIRST YEAR STUDENT.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

COUTTS, E. G.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE	*in Accounts, given by the Members of the Public Works Account Department, India*	SIMPSON, M. G.
"	*Descriptive Engineering*	CURRIE, H. A. F.
"	*Applied Mechanics*	CURRIE, H. A. F.
"	*Project and Designs—First Prize*	CURRIE, H. A. F.
"	" *Second Prize*	ELDRIDGE, H. J.
"	*Estimating*	CURRIE, H. A. F.

		SECOND YEAR STUDENTS.	FIRST YEAR STUDENTS.
PRIZE	*in Descriptive Engineering*	SMITH-AINSLEY, B. E.	OUTRAM, F. D.
"	*Surveying*	HOWARD, W. H. K.	DAWSON, F. G. R.
		prox. acc. CLAYTON, F.	*prox. acc.* COUTTS, E. G.
"	*Architecture*	DUPUIS, C. E.	
"	*Geometrical Drawing*	SMITH-AINSLEY, B. E.	DAWSON, F. G. R.
"	*Freehand Drawing*		ROMILLY, A. G.
"	*Workshop Practice*	BAINES, H. M.	WEST, R. H.
"	*Mathematics*	PITOT, L. E.	COCHEMÉ, A. E.
"	*Chemistry*		CRAVEN, A. J.
"	*Geology*	ROGERS, C. G.	
"	*Physics*	MEYER, J. L.	COCHEMÉ, A. E.
"	*Physical Laboratory*	COX, F. N.	
"	*Chemical Laboratory*	BUDHBHATTI, K. S.	COCHEMÉ, A. E.
"	*for General Merit, Forestry Course*	ROGERS, C. G.	OSMASTON, B. B.
"	" " *Telegraph Course*	SIMPSON, M. G.	
"	*Gymnastics*	GABBETT, E.	

412+16 = 428

SIXTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1887—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Currie, H. A. F., *F.C.H.*	**Young, E. H.*	Tayler, F. V.	Heaton, B.
Williams, W. R., *F.C.H.*	Herbert, E. C.	MacCarthy, A. H. C.	Jones, H. C.
Gale, A. B.	Western, R. W.	Mawson, E. O.	Keeling, H. T.
Eldridge, H. J.	Wilson, C. D. D.	Trapmann, A. G. R.	**Mildred, C.*

As Assistant Superintendents, Telegraph Department.

Simpson, M. G. | Mahon, G.

As Junior Assistant Conservators, Forest Department, November 1887.

Rogers, C. G. | Hart, G. S. | Hill, M. | Oliver, E. G.

PASSED LIST, 1887.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
	FIRST CLASS.	**FIRST CLASS.**	**FIRST CLASS.**	**FIRST CLASS.**
Currie, H. A. F.	Currie	Currie	Currie	Gale
Williams, W. R.	Williams, W. R.	Williams, W. R.	Young	Eldridge
Gale, A. B.		Western		MacCarthy
Eldridge, H. J.		Gale		Herbert
Young, E. H.				Jones
Herbert, E. C.				
Western, R. W.				
Wilson, C. D. D.				
Tayler, F. V.				
MacCarthy, A. H. C.				
Mawson, E. O.				
Trapmann, A. G. R.				
Heaton, B.				
Jones, H. C.				
Keeling, H. T.				
Stanton, J. C.				
Mildred, C.				
Clarke, F. P. S.				
Langlands, A. W.				
Moreton, E. C.				
Staples, S. F.				
	SECOND CLASS.	**SECOND CLASS.**	**SECOND CLASS.**	**SECOND CLASS.**
	Eldridge	Clarke	Williams, W. R.	Western
	Herbert	Keeling, Mildred	Tayler	Stanton
	Stanton	Herbert, Young	Gale	Clarke
	Wilson	Jones	Eldridge	Currie, Young
	Mawson	Wilson	MacCarthy	Williams
	Heaton	MacCarthy, Trapmann	Jones, Trapmann	Trapmann
	Gale	Mawson	Wilson	Wilson
	Tayler, Young	Eldridge, Langlands	Western	Heaton, Keeling
	Mildred	Heaton	Heaton	Staples
	Keeling	Tayler	Mawson	Mawson
	Trapmann	Moreton	Herbert, Langlands	Langlands
	Moreton	Stanton, Staples.	Mildred	Moreton
	Jones, MacCarthy		Clarke	Tayler
	Western		Keeling	Mildred
	Clarke		Moreton	
	Langlands		Stanton	
	Staples		Staples	

TELEGRAPH COURSE.

Simpson, M. G. | Mahon, G.

NOTE.—First Class Students hold the Diploma of Associate of Coopers Hill. Second Class, Telegraph, and Forest Students, hold the Diploma of Qualification.

* Mr. Young was afterwards disqualified on medical examination, and Mr. Mildred was accepted instead, Mr. Stanton having first declined the appointment.

SIXTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1887—*Continued.*

ORDER IN MERIT.

SECOND YEAR.					FIRST YEAR.
ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.	ORDER IN GENERAL MERIT.
Clayton, F. Dupuis, C. E. Howard, W. H. K. Bell, E. A. S. Pitot, L. E. Meyer, J. L. Cox, F. N. Smith-Ainsley, B.E. Gregory, J. M. Lloyd, C. V. Gabbett, E. Sutherland, J. Sen, P. N. Holms, W. F. Baines, H. M. Bader, F. R. Ridout, J. B. M. Budhbhatti, K. S. Wright, F. J. Bowker, J. A. Cumming, E. A. Buscarlet, F. C. Court, R. F. Marriott, D. Wade, E. H. Coxe, R. K. Doughty, G. C. Campbell, A. G. Cape, G. A. S. Ellis, J. S. H. Pocklington, F. A. O'Donoghue, F. H. Johnson, G. W. Couper, J. C. O. William, W. A.	Smith-Ainsley Dupuis Howard Baines Lloyd Clayton Meyer Cox, F. N. Bell Sutherland Gabbett Pitot Bader Bowker Court Buscarlet Gregory Ridout Sen Wade Marriott Holms Cape Wright Cumming Budhbhatti Pocklington Coxe, R. K. Doughty Campbell Ellis O'Donoghue Johnson Couper William	Bell Clayton Cox, F. N. Dupuis Meyer Howard Pitot Cumming Lloyd Budhbhatti Gabbett Sen Smith-Ainsley Holms Wright Gregory Bader Sutherland Baines Bowker Coxe, R. K. Ridout Doughty Marriott Wade Campbell Court Buscarlet Cape Ellis Pocklington O'Donoghue William, W. A. Johnson Couper	**FIRST CLASS.** Clayton Pitot Bell Howard Dupuis Gregory **SECOND CLASS.** Holms Meyer Sen Ridout Gabbett Cox, F. N. Sutherland Budhbhatti Smith-Ainsley Lloyd Wright Bader Cumming Wade Coxe, R. K. Bowker Marriott Doughty Baines Campbell Buscarlet	Cox, F. N. Budhbhatti Meyer Dupuis Smith-Ainsley Clayton Wright Gregory Howard Lloyd Pitot Campbell Bell Sutherland Coxe, R. K. Doughty Gabbett Sen Cumming Bader Holms Bowker Ridout Marriott Court Baines Buscarlet Ellis Cape Wade Couper O'Donoghue Johnson William Pocklington	Coutts, E. G. Cochemé, A. E. Dawson, F. G. R. Lugard, E. A. Craven, A. J. West, R. H. *Outram, F. D. Smith, C. M. Knox, R. F. Mills, W. H. Smith, O. S. Cradock, A. J. Playfair, W. Bull, F. E. Bose, L. M. Hudson, E. J. B. Turner, H. H. Henderson, W. P. Cather, G. F. Romilly, A. G. Jenkins, W. Howley, W. J. Williams, C. B. Cuffe, O. F. L. W. Graves, J. T. Yeates, R. H. M. Livingston, W. Bowman, J. Hutton, A. E. Strachey, R. Landon, L. Norton, E. J. P. Benett, A. L. Halliday, C. O. Walsh, C. F. Hill, C. E. Efflatoun, M. Bagot, W. E. Gairdner, J. J. D. Seass, R. H. Riddell, C. Macdonald, J. D. Baker, G. H. M.
FOREST STUDENTS. Rogers, C. G. Hart, G. S. Hill, M. Oliver, E. G.					*FOREST STUDENTS.* Osmaston, B. B. Monro, A. V. Haines, H. H. Carter, H. Blunt, A. W. McArthy, C. D. Tottenham, W. F. L. Branthwaite, F. J. Thompson, H. M.

* Absent for a part of the Session.

SEVENTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1888.

APPOINTED FELLOWS OF COOPERS HILL.

CLAYTON, F. | BELL, E. A. S. | DUPUIS, C. E.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

Argyll Scholar in Natural Science.

Scholarship given by the Viscount Cross, Secretary of State for India.

COX, F. N.

Scholar in Applied Mechanics.

Scholarship of the Vice-President of the Council of India.

*(BELL, E. A. S.) | CLAYTON, F. | MEYER, J. L.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill.

BELL, E. A. S.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

DAWSON, F. G. R.

Scholar in Applied Mechanics.

Scholarship of the Vice-President of the Council of India.

COUTTS, E. G.

Chesney Scholar in Mathematics.

COCHEMÉ, A. E.

President's Scholar in Forestry.

OSMASTON, B. B.

FIRST YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

WALSH, A. R.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE	*in Accounts, given by the Members of the Public Works Account Department, India*	BELL, E. A. S.
"	*Descriptive Engineering*	DUPUIS, C. E.
"	*Applied Mechanics*	BELL, E. A. S.
"	*Project and Designs—First Prize*	BAINES, H. M.
"	" *Second Prize*	DUPUIS, C. E.
"	*Estimating*	MEYER, J. L.
"	*Gymnastics*	GABBETT, E.

* Disqualified by the rule precluding a Student from holding more than one Scholarship.

	Second Year Students.	First Year Students.
PRIZE *in Descriptive Engineering* .	Outram, F. D.	
„ *Surveying* . . .	Dawson, F. G. R.	Clutterbuck, P. H. Walsh, A. R.
„ *Architecture* . . .	Romilly, A. G.	
„ *Geometrical Drawing* .	Dawson, F. G. R.	Walsh, A. R.
„ *Freehand Drawing* .	Tottenham, W. F. L.	
„ *Workshop Practice* . .	Cuffe, O. F. L. W.	Griffin, J. V. Walsh, C. P., *prox. acc.*
„ *Mathematics*		Belcher, W. E. G.
„ *Chemistry*		Harvey, F. J.
„ *Geology*	Lugard, E. A.	Walsh, A. R.
„ *Physics*	Monro, A. V. .	Walsh, A. R. Christie, H. R. S., *prox. acc.*
„ *Physical Laboratory*	Monro, A. V. Playfair, W.	
„ *Chemical Laboratory* .	Playfair, W. .	Harvey, F. J. Walsh, A. R.
„ *Botany*	Haines, H. H.	
„ *General Merit, Forestry Course*	. . . . .	Caccia, A. M. F.
Dr. Schlich's Prize—Forest Working Plans	Monro, A. V.	
„ „ *Sylviculture*		Lovegrove, W. H.

SEVENTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1888—*Continued.*

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Clayton, F., *F.C.H.*
Bell, E. A. S., *F.C.H.*
Dupuis, C. E., *F.C.H.*
‡*Meyer, J. L.*
Howard, W. H. K.
**Pitot, L. E.*
Cox, F. N.
Lloyd, C. V.
Gregory, J. M.
Gabbett, E.
Sutherland, J.
Sen, P. N.
Holms, W. F.
Wright, F. J.
Baines, H. M.
**Bäder, F. R.*

As Assistant Superintendents, Telegraph Department.

Hudson, E. J. B. | Henderson, W. P.

PASSED LIST, 1888.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
Clayton, F. Bell, E. A. S. Dupuis, C. E. ‡Meyer, J. L. Howard, W. H. K. Pitot, L. E. †Cox, F. N. Lloyd, C. V. Gregory, J. M. Gabbett, E. Sutherland, J. Sen, P. N. Holms, W. F. Wright, F. J. Baines, H. M. Bäder, F. R. Bowker, J. A. Ridout, J. B. M. ‡Cumming, E. A. Budhbhatti, K. S. Buscarlet, F. C. Marriott, D. †Wade, E. H. Coxe, R. K.	**FIRST CLASS.** Dupuis Baines Clayton Howard Lloyd, C. V.	**FIRST CLASS.** Bell Clayton Meyer Dupuis Cumming Pitot Howard Wright, F. J. Cox, F. N.	**FIRST CLASS.** Clayton Pitot Bell Howard Dupuis Gregory	**FIRST CLASS.** Cox, F. N. Budhbhatti Meyer Wright, F. J. Bell
	SECOND CLASS. Sutherland Meyer Bell Gabbett Cox, F. N. Pitot Buscarlet Bäder Bowker Holms Sen Gregory Marriott Wade Ridout Wright, F. J. Cumming Budhbhatti Coxe, R. K.	**SECOND CLASS.** Sen Holms Lloyd, C. V. Bäder Gabbett Gregory Bowker Sutherland Budhbhatti Ridout Baines Coxe, R. K. Marriott Wade Buscarlet	**SECOND CLASS.** Holms Meyer Sen Ridout Gabbett Cox, F. N. Sutherland Budhbhatti Lloyd, C. V. Wright, F. J. Bäder Cumming Wade Coxe, R. K. Bowker Marriott Baines Buscarlet	**SECONL CLASS.** Gregory Pitot Dupuis Coxe, R. K. Sen Clayton Cumming Howard Lloyd, C. V. Bäder Bowker Ridout Sutherland Gabbett Holms Wade Marriott Baines Buscarlet
RE-EXAMINED IN BRANCH II. Godden, H. L.		*FROM PREVIOUS YEAR.* Godden, H. L.		

TELEGRAPH COURSE.

Hudson, E. J. B. | Henderson, W. P.

NOTE.—First Class Students hold the Diploma of Associate of Coopers Hill. Second Class, Telegraph, and Forest Students hold the Diploma of Qualification.

* Mr. Pitot and Mr. Hudson were afterwards disqualified on medical examination, and Mr. Bäder was accepted instead of Mr. Pitot. Some months later Mr. Hudson was accepted as medically qualified.

† Absent from part of the Examination.

‡ Messrs. Meyer and Cumming received Commissions in the Royal Engineers in 1889.

SEVENTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1888—*Continued.*

ORDER IN MERIT.

SECOND YEAR.					FIRST YEAR.
ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.	ORDER IN GENERAL MERIT.
Coutts, E. G. Lugard, E. A. Cocheme, A. E. Craven, A. J. Bull, F. E. West, R. H. Dawson, F. G. R. Knox, R. F. Mills, W. H. Smith, C. M. Playfair, W. Bose, L. M. *Outram, F. D. *Smith, O. S. Turner, H. H. Cradock, A. J. Jenkins, W. Howley, W. J. Romilly, A. G. Cuffe, O. F. L. W. Cather, G. F. *Yeates, R. H. M. Williams, C. B. Livingston, W. Benett, A. L. Strachey, R. Bowman, J. Landon, L. Halliday, C. O. Gairdner, J. J. D. Norton, E. J. P. Efflatoun, M. *Bagot, W. E. Macdonald, J. D. Sears, R. H. Riddell, C.	Dawson Coutts Outram Jenkins West Romilly Lugard Smith, C. M. Craven Cradock Turner Cuffe Knox Playfair Bull Cochemé Mills Smith, O. S. Howley Livingston Cather Bowman Williams Yeates Halliday Bose Strachey Landon Benett Gairdner Norton Bacot Efflatoun Macdonald, J. D. Sears Riddell	Coutts Lugard Knox Cochemé Mills Bose Craven Bull Playfair Smith, C. M. West Dawson Turner Smith, O. S. Jenkins Outram Cradock Yeates Howley Cuffe Strachey Bowman Benett Halliday Romilly Gairdner Livingston Landon Cather Williams Efflatoun Norton Riddell Bagot Sears Macdonald, J. D.	**FIRST CLASS.** Cochemé Bose Bull Coutts Knox Lugard **SECOND CLASS.** West Mills Smith, C. M. Dawson Craven Smith, O. S. Outram Playfair Cather Cradock Turner Howley Landon Jenkins Cuffe Yeates Gairdner Strachey Williams Romilly Livingston Bowman Halliday Benett	Craven Playfair Mills Lugard West Bull Cochemé Coutts Smith, C. M. Cather Cradock Dawson Knox Smith, O. S. Outram Williams Bose Howley Turner Benett Strachey Yeates Jenkins Livingston Romilly Cuffe Bowman Halliday Landon Norton Gairdner Efflatoun Sears Bagot Macdonald, J. D. Riddell	Walsh, A. R. Christie, H. R. S. Barnard, H. O. Belcher, W. E. G. Standley, A. W. O'Hara, J. G. M. Paterson, R. S. Macdonald, R. H. Barnett, W. G. de Segrais, P. le J. Wildeblood, J. P. Zorab, J. Reid, R. N. H. Wright, F. Harvey, F. J. Cowley, F. A. A. Griffin, J. V. Marshall, D. *Meredith, R. Davie, W. G. Leslie, N. U. K. Smith, E. A. Walsh, C. P. Coo, C. W. Sconce, H. A. K. Nathan, G. E. Mayston, H. Youge, M. E. Lambert, F. G. Hull, P. W. Thompson, R. W. Russell, J. L'Estrange, H. G. Ziegler, G. H. O. *Douglas, S. A. H. W. Shawe-Taylor, F. Pedder, D. P. Thorp, R. F. Burrows, E. Humphreys, T. H. A. Judd, C. R. Hemingway, P. C.
FOREST STUDENTS. Osmaston, B. B. Haines, H. H. Monro, A. V. Carter, H. Blunt, A. W. Branthwaite, F. J. O'Bryen, E. A. McArthy, C. D'A. Tottenham, W. F. L. Thompson, H. N.					*FOREST STUDENTS.* Caccia, A. M. F. Clutterbuck, P. H. Grenfell, A. P. Lovegrove, W. H. Long, G. E. Lloyd, W. F. McHarg, W. T. T. Bruce, C. W. A. Thornton, C. du P. Jackson, A. B. Kershawe, L.

* Absent from part of the Examir

EIGHTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1889.

APPOINTED FELLOW OF COOPERS HILL.

COUTTS, E. G.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

Argyll Scholar in Natural Science.

Scholarship given by the Viscount Cross, Secretary of State for India.

CRAVEN, A. J.

Scholar in Applied Mechanics.

Scholarship of the Vice-President of the Council of India.

*(COUTTS, E. G.) | BULL, F. E.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill.

COUTTS, E. G.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

WALSH, A. R.

Scholar in Applied Mechanics.

Scholarship of the Vice-President of the Council of India.

REID, R. N. H.

Chesney Scholar in Mathematics.

BELCHER, W. E. G.

President's Scholar in Forestry.

GRENFELL, A. P.

FIRST YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

RICHARDS, G.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE in	*Accounts, given by the Members of the Public Works Account Department, India*	KNOX, R. F.
"	*Descriptive Engineering*	OUTRAM, F. D.
"	*Applied Mechanics*	COUTTS, E. G.
"	*Project and Designs—First Prize*	OUTRAM, F. D.
"	*Second Prize*	COUTTS, E. G. *Acc.* DAWSON, F. G. R.
"	*Estimating*	MILLS, W. H.

* Disqualified by the rule precluding a Student from holding more than one Scholarship.

		Second Year Students.
PRIZE	*in Descriptive Engineering*	Christie, H. R. S.
,,	*Surveying*	Walsh, A. R. / Walsh, C. P.
,,	*Architecture*	Barnard, H. O.
,,	*Geometrical Drawing*	Walsh, C. P.
,,	*Freehand Drawing*	
,,	*Workshop Practice*	Griffin, J. V.
,,	*Mathematics*	
,,	*Chemistry*	
,,	*Geology*	
,,	*Physics*	Walsh, A. R.
,,	*Physical Laboratory*	Barnett, W. G.
,,	*Chemical Laboratory*	de Segrais, P. le J.
	General Merit — First Year Course	
	Botany	Grenfell, A. P.
,,	*General Merit, Forestry Course*	Caccia, A. M.
,,	*Gymnastics*	

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PASSED FOR THE INDIAN PUBLIC SE

As Assistant Engineers, Second Grade. (Orde

Coutts, E. G., *F.C.H*	Smith, C. M.	**Outram, F. D.*
Lugard, E. A.	Dawson, F. G. R.	Playfair, W.
Bull, F. E.	Cochemé, A. E.	**Turner, H. H.*
**Craven, A. J.*	**West, R. H.*	Bose, L. M.
**Knox, R. F.*	Mills, W. H.	Jenkins, W.

As Assistant Superintendents, Telegraph Dep

Meredith, R. | Le

As Junior Assistant Conservators, Forest Departme

Osmaston, B. B.	Branthwaite, F. J.	Tott
Haines, H. H.	Blunt, A. W.	Tho
Monro, A. V.	O'Bryen, E. A.	
Carter, H.	McArthy, C. D'A.	

* Messrs. Craven, Knox, West, Outram, and Turner received Comm
later in 1889; and Messrs. O. S. Smith, Romilly, Cune, Howley, and Ca

EIGHTEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1889—*Continued.*

PASSED LIST, 1889.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
Coutts, E. G.	**FIRST CLASS.**	**FIRST CLASS.**	**FIRST CLASS.**	**FIRST CLASS.**
Lugard, E. A.	Coutts	Coutts	Cochemé	Craven, A. J.
Bull, F. E.	Outram	Bull	Bose	Playfair
*Craven, A. J.	Dawson	Knox	Bull	Mills
*Knox, R. F.	Jenkins	Lugard	Coutts	West
Smith, C. M.	Romilly	Cochemé	Knox	Bull
Dawson, F. G. R.		Smith, C. M.	Lugard	Lugard
Cochemé, A. E.		Mills		Smith, C. M.
*West, R. H.	**SECOND CLASS.**	Craven, A. J.	**SECOND CLASS.**	**SECOND CLASS.**
Mills, W. H.	Turner	**SECOND CLASS.**	West	Smith, O. S.
*Outram, F. D.	Knox	Outram	Mills	Cochemé
Playfair, W.	Lugard	Bose	Smith, C. M.	Coutts
*Turner, H. H.	West	Dawson	Dawson	Benett
Bose, L. M.	Smith, C. M.	Playfair	Craven, A. J.	Williams, C. B.
Jenkins, W.	Cuffe	Turner	Smith, O. S.	Cather
Smith, O. S.	Playfair	West	Outram	Cradock
Romilly, A. G.	Bull	Jenkins	Playfair	Dawson
Cuffe, O. F.	Mills	Cuffe	Cather	Knox
†*Cradock*, A. J.	Craven, A. J.	Smith, O. S	Cradock	Outram
Howley, W. J.	Cochemé	Cradock	Turner	Landon
Cather, G. F.	Cradock	Romilly	Howley	Strachey
*Yeates, R. H.	Smith, O. S.	Bowman	Landon	Bose
Benett, A. L.	Bose	Benett	Jenkins	Howley
Williams, C. B.	Howley	Halliday	Cuffe	Turner
Bowman, J.	Yeates	Strachey	Yeates	Bowman
*Halliday, C. O.	Halliday	Howley	Strachey	Halliday
Landon, L.	Rowman	Yeates	Williams	Yeates
Strachey, R.	Williams, C. B.	Cather	Romilly	Jenkins
	Cather	Strachey	Bowman	Romilly
	Benett	Williams, C. B.	Halliday	Cuffe
	Strachey	Landon	Benett	
	Landon			

TELEGRAPH COURSE.

Meredith, R. | Leslie, N. U. K.

NOTE.—First Class Students hold the Diploma of Associate of Coopers Hill. Second Class, Telegraph, and Forest Students hold the Diploma of Qualification.

* Messrs. Craven, Knox, West, Outram, Turner, Yeates, and Halliday received Commissions in the Royal Engineers later in 1889.

† Deceased.

EIGHTEENTH SESSIO

ANNUAL EXAMINATIONS, JULY 1

ORDER IN MERIT.

SECOND YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BR
Walsh, A. R.	Walsh, A. R.	Reid	**FIRST CLASS.**	W
*Christie, H. R. S.	Barnard	Zorab		P
Belcher, W. E. G.	Walsh, C. P.	Barnett	Belcher	C
Barnett, W. G.	Griffin	O'Hara	Christie	d
Standley, A. W.	Christie	Belcher	O'Hara	H
Barnard, H. O.	Wright	Christie	Standley	W
O'Hara, J. G. M.	Marshall	Walsh, A. R.	Barnett	R
*Macdonald, R. H.	Paterson	Standley		B
Paterson, R. S.	de Segrais	Paterson		D
de Segrais, P. le J.	Wildeblood	Davie		S
Reid, R. N. H.	Macdonald, R. H.	Cowley		B
Wildeblood, J. P.	Barnett	de Segrais		C
Zorab, J.	Harvey	Barnard		M
Wright, F.	Reid	Macdonald, R. H.		
Griffin, J. V.	Belcher	Marshall		B
Cowley, F. A. A.	Standley	Wildeblood		W
Marshall, D.	O'Hara	Griffin	**SECOND CLASS.**	O
Davie, W. G.	Cowley	Wright		Z
Harvey, F. J.	Davie	Harvey	Macdonald, R. H.	G
Walsh, C. P.	Lambert	Hull		M
Sconce, H. A. K.	Sconce	Sconce	Walsh, A. R.	S
Lambert, F. G.	Zorab	Walsh, C. P.	Barnard	W
Hull, P. W.	Hull	Douglas	Zorab	H
Taylor, F. Shawe	Taylor, F. Shawe	Lambert	Paterson	T
Douglas, S. A. H. W.	Thompson	Taylor, F. Shawe	Wildeblood	T
Thompson, R. W.	Thorp	Thorp	de Segrais	
Thorp, R. F.	Pedder	Thompson	Cowley	D
Pedder, D. P.	Douglas	Pedder	Reid	L
			Marshall	P
FOREST STUDENTS.			Griffin	T
			Davie	
Grenfell, A. P.			Douglas	
Caccia, A. M.			Wright	
Lovegrove, W. H.			Walsh, C. P.	
Clutterbuck, P. H.			Harvey	
Long, G. R.			Sconce	
McHarg, W. T.			Lambert	
Lloyd, W. F.				
Bruce, C. W.				
Thornton, C. du P.				
Jackson, A. B.				

* Mr. Macdonald received a commission in the Royal Engineers in Feb. 1890.

NINETEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1890.

APPOINTED FELLOW OF COOPERS HILL.

WALSH, A. R.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

Argyll Scholar in Natural Science.

Scholarship given by the Viscount Cross, Secretary of State for India.

WALSH, A. R.

Scholar in Applied Mechanics.

Scholarship of the Vice-President of the Council of India.

BARNETT, W. G.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill.

BARNARD, H. O.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

WILLMOTT, H. M.

Scholar in Applied Mechanics.

Scholarship of the Vice-President of the Council of India.

HEAP, J. H.

Chesney Scholar in Mathematics.

RICHARDS, G.

President's Scholar in Forestry.

OSMASTON, L. S.

FIRST YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

MORRES, J. L.

PRIZEMEN.

PRIZE *in Accounts, given by the Members of the Public Works Account Department, India* — MESSER, J.

THIRD YEAR STUDENTS.

"	*Descriptive Engineering*	BARNARD, H. O.
"	*Applied Mechanics*	BARNETT, W. G.
"	*Project and Designs—First Prize*	DE SEGRAIS, P. LE J.
"	" *Second Prize*	BARNARD, H. O. WALSH, C. P.
"	*Estimating*	BARNARD, H. O.

		Second Year Students.
PRIZE	*in Descriptive Engineering* .	Willmott, H. M.
,,	*Surveying* . . .	Willmott, H. M. .
,,	*Architecture* . . .	Morin, A. H.
,,	*Geometrical Drawing* .	Willmott, H. M. .
,,	*Freehand Drawing*	
,,	*Workshop Practice* . .	Coode, C. L. .
,,	*Mathematics* . . .	Heap, J. H. .
,,	*Chemistry*	
,,	*Geology*	Henvey, F. C. .
,,		*Prox. Acc.* Osmaston, L. S.
,,	*Physics*	Messer, J. . .
,,	*Physical Laboratory* .	Heap, J. H.
,,	*Chemical Laboratory* .	Stotherd, C. E. .
		Prox.
,,	*Botany*	Henvey, F. C.
,,	*General Merit, Forestry Course*	Henvey, F. C. .
,,	*Gymnastics*	

164 + 28 = 492

PASSED FOR THE INDIAN PUBLIC S

As Assistant Engineers, Second Grade. (Orde

Walsh, A. R., *F.C.H.*	**de Segrais, P. le J.*	Wildeblood, J.
**Barnard, H. O.*	O'Hara, J. G. M.	Cowley, F. A.
**Barnett, W. G.*	Reid, R. N.	**Zorab, J.*
Belcher, W. E. G.	Paterson, R. S.	Griffin, J. V.
Standley, A. W.	Wright, F.	Davie, W. G.

As Assistant Superintendents, Telegraph De

**Coo, C. W.*

As Junior Assistant Conservators, Forest Departme

Grenfell, A. P.	Long, G. R.	
Caccia, A. M.	Clutterbuck, P. H.	
Lovegrove, W. H.	McHarg, W. T.	
	Lloyd, W. F.	

* Messrs. Barnard, Barnett, and de Segrais were afterwards disqualifie[d]; D. Marshall, F. J. Harvey and C. P. Walsh were accepted instead. Messrs disqualified, but were accepted on re-examination.

NINETEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1890—*Continued.*

PASSED LIST, 1890.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
Walsh, A. R. Barnard, H. O. Barnett, W. G. Belcher, W. E. G. Standley, A. W. de Segrais, P. le J. O'Hara, J. G. M. Reid, R. N. Paterson, R. S. Wright, F. Wildeblood, J. P. Cowley, F. A. Zorab, J. Griffin, J. V. Davie, W. G. Marshall, D. Harvey, F. J. Walsh, C. P. Sconce, H. A. Lambert, F. G.	**FIRST CLASS.** Walsh, C. P. Barnard Griffin Walsh, A. R. Wildeblood Marshall de Segrais **SECOND CLASS.** Reid Wright O'Hara Harvey Barnett Paterson Belcher Cowley Standley Davie Sconce Zorab Lambert	**FIRST CLASS.** Barnett Barnard Belcher Reid Walsh, A. R. **SECOND CLASS.** Standley Zorab de Segrais O'Hara Wright Davie Cowley Paterson Marshall Wildeblood { Griffin { Harvey Walsh, C. P. Sconce Lambert	**FIRST CLASS.** Belcher Standley O'Hara Barnett **SECOND CLASS.** Walsh, A. R. Barnard Zorab Paterson Wildeblood de Segrais Cowley Reid Marshall Griffin Davie Wright Walsh, C. P. Sconce Harvey Lambert	**FIRST CLASS.** Walsh, A. R. de Segrais Harvey Paterson Wright Davie Barnard Cowley Standley **SECOND CLASS.** Barnett Belcher Reid Wildeblood Zorab O'Hara Marshall Griffin Lambert Sconce Walsh, C. P.

TELEGRAPH COURSE.

Coo, C. W. | Mayston, H.

NOTE.—First Class Students hold the Diploma of Associate of Coopers Hill. Second Class, Telegraph, and Forest Students hold the Diploma of Qualification.

NINETEENTH SESSION.

ANNUAL EXAMINATIONS, JULY 1890—*Continued.*

ORDER IN MERIT.

SECOND YEAR.					FIRST YEAR.
ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.	ORDER IN GENERAL MERIT.
Richards, G. *Heap, J. H. Willmott, H. M. Marsily, W. E. Streatfeild, G. H. Robertson, H. C. Stotherd, C. E. White, J. H. Todd, R. Walton, H. R. Smith, E. A. Corbett, P. J. Lewis, L. W. Latham, P. M. Laurie, G. C. Johnson, C. W. Gahagan, E. G. Morin, A. H. Hutton, W. Attfield, H. S. *Finlaison, H. G. Craven, L. B. Coode, C. L. Barlow, T. McIntosh, A. Sawhny, B. R. Judd, C. R. Berkeley, A. M. Borrero, V. Nathan, G. E. Henderson, G. R. *Humphreys, T. H. Boyle, J. C. Leicester, A. H. Wild, E. C. *FOREST STUDENTS.* Osmaston, L. S. Coventry, E. M. Henvey, F. C. Messer, J. Menzies, V. S. Hodgson, C. M. McIntosh, R. Forteath, H. H. Foulkes, G. F. Bryant, H. B. Burn-Murdoch, A. M.	Willmott Streatfeild Richards Heap Morin Corbett Walton Lewis Stotherd White Coode Laurie, G. C. Hutton Smith, E. A. Todd Marsily Nathan Gahagan Johnson Roberton Finlaison Attfield McIntosh, A. Craven Barlow Judd Latham Borrero Berkeley Henderson Boyle Wild Humphreys Sawhny Leicester	Heap Richards Marsily Willmott Smith, E. A. Todd Walton Stotherd White Streatfeild Latham Corbett Robertson Gahagan Lewis Laurie, G. C. Johnson Attfield Finlaison Hutton Barlow Coode { Morin { Sawhny Craven Judd McIntosh Borrero Humphreys Henderson Berkeley Leicester Boyle Wild Nathan	**FIRST CLASS.** Richards Heap Marsily White Robertson Willmott — **SECOND CLASS.** Latham Todd { Gahagan { Stotherd Corbett Streatfeild Smith, E. A. Walton Johnson Laurie, G. C. Attfield Lewis Leicester Hutton { Finlaison { Sawhny Craven Coode Morin Borrero Berkeley Judd Barlow McIntosh Boyle Henderson	Richards Heap Stotherd Johnson Willmott Robertson Lewis Hutton Laurie, G. C. Attfield Marsily Smith, E. A. Craven Finlaison { Gahagan { Morin Latham Streatfeild Todd Corbett Sawhny Walton Barlow Berkeley Henderson Coode Judd White Humphreys Borrero Boyle McIntosh Nathan Leicester Wild	Morres, J. L. Lister, E. A. Meli, J. Lillie, G. E. Laurie, A. C. Pearce, E. N. Fleming, C. A. Trninger, L. Parker, J. M. Stirling, J. L. Robertson, T. B. Stuart, M. V. de Chazal, A. B. Croslegh, L. C. Benson, E. E. McMeekin, J. B. Sutherland, W. Sibold, C. W. Bhore, J. Thomas, W. M. Wickham, P. F. Polwhele, J. A. *Carnegie, Hon. D. W. Betton, C. S. Hemsley, E. V. Napier, G. Wrey, G. B. Isaac, B. A. Forbes, D. G. *Manuk, J. T. *FOREST STUDENTS.* Leete, F. A. Tulloch, J. C. Carr, S. Edie, H. S. Hatt, C. C. Fisher, W. F. Trafford, F. Napier, O. L. H. Long, A. M. O'Leary, J. L. M. Cowley-Brown, F. L.

* Absent from part of the Examination.

TWENTIETH SESSION.

ANNUAL EXAMINATIONS, JULY 1891.

APPOINTED FELLOWS OF COOPERS HILL.

RICHARDS, G. HEAP, J. H. WILLMOTT, H M.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

Argyll Scholar in Natural Science.

Scholarship given by the Viscount Cross, Secretary of State for India.

RICHARDS, G.

Scholar in Applied Mechanics.

Scholarship of the Vice-President of the Council of India.

*(HEAP, J. H., RICHARDS, G.) STOTHERD, C. E.

FELLOWS' SCHOLAR.

Scholarship established by the Fellows of Coopers Hill.

*(RICHARDS, G.) HEAP, J. H.

SECOND YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship in Engineering on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

MORRES, J. L.

Scholar in Applied Mechanics.

Scholarship of the Vice-President of the Council of India.

LILLIE, G. E.

Chesney Scholar in Mathematics.

LISTER, E. A.

President's Scholar in Forestry.

LEETE, F. A.

FIRST YEAR STUDENTS.

FOUNDATION SCHOLAR.

Scholarship on the Coopers Hill Endowment Fund, established by the Civil Engineers of the Public Works Department.

COATES, J. *Prox. Acc.* SULLIVAN, W.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE in	*Descriptive Engineering*	RICHARDS, G.
,,	*Applied Mechanics*	HEAP, J. H.
,,	*Project and Designs—First Prize* .	WILLMOTT, H. M.
,,	,, *Second Prize* .	WALTON, H. R.
,,	*Accounts*	CARE, S.
,,	*Estimating*	COODE, C. L.

* Disqualified by the rule precluding a Student from holding more than one Scholarship.

		Second Year Students.	First Year Students.
PRIZE	in *Descriptive Engineering* .	Morres, J. L.	Montgomery, A. S
"	*Surveying* . . .	Meli, J. .	Billson, H. G.
"	*Architecture* . .	Laurie, A. C.	
"	*Geometrical Drawing* .	Laurie, A. C.	Proes, E. M.
"	*Freehand Drawing* . . .	. . .	Gordon, G. H.
"	*Workshop Practice* . .	Morres, J. L.	Branfill, B.
"	*Mathematics* . . .	Lillie, G. E.	Stapleton, B.
"	*Chemistry* . . .	. . .	Collins, F. R.
"	*Geology*	Tulloch, J. C.	Duxbury, G. R.
			Prox. Acc. Abbey, C. C.
"	*Physics*	Pearce, E. N.	Billson, H. G.
"	*Physical Laboratory* .	Laurie, A. C.	
"	*Chemical Laboratory* .	Pearce, E. N.	Collins, F. R.
"	*General Merit, First Year Course*	. . .	Sullivan, W.
"	*Botany*	Leete, F. A.	
"	*General Merit, Forestry Course*	Leete, F. A.	Billson, H. G.

PASSED FOR THE INDIAN PUBLIC SERVICE.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Richards, G., *F.C.H.*	Streatfeild, G. H. M.	**Todd, R.*	**Attfield, H. S.*
Heap, J. H., *F.C.H.*	Robertson, H. C.	Johnson, C. W.	**Hutton, W.*
Willmott, H. M., *F.C.H.*	Smith, E. A.	Corbett, P. J.	**Morin, A. H.*
**Stotherd, C. E.*	Laurie, G. C.	Gahagan, E. G.	
Walton, H. R.	Lewis, L. W.	White, J. H.	

As Assistant Superintendents, Telegraph Department.

Sutherland, W. | Truninger, L.

As Assistant Conservators, 3rd Grade, Forest Department, October 1890.

Henvey, F. C.	Osmaston, L. S.	Foulkes, G. F.
Coventry, E. M.	McIntosh, R.	Forteath, H. H.
Messer, J.	Hodgson, C. M.	Bryant, H. B.
Menzies, V. S.	Burn-Murdoch, A. M.	

* Messrs. Stotherd and Todd and, later, Mr. Attfield were disqualified on medical examination, Messrs. Hutton and Morin being accepted in their place.

TWENTIETH SESSION.

ANNUAL EXAMINATIONS, JULY 1891—*Continued.*

PASSED LIST, 1891.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
Richards, G.	**FIRST CLASS.**	**FIRST CLASS.**	**FIRST CLASS.**	**FIRST CLASS.**
Heap, J. H.	Willmott	Heap	Richards	Richards
Willmott, H. M.	Walton	Richards	Heap	Heap
Stotherd, C. E.	Richards	Marsily	Marsily	Stotherd
Walton, H. R.	Streatfeild	Stotherd	White	Johnson
Streatfeild, G. H. M.	Heap	Walton	Robertson	Lewis
Marsily, W. E.		Willmott	Willmott	Robertson
Robertson, H. C.				Laurie, G. C.
Smith, E. A.				Attfield
{Laurie, G. C.				Hutton
{Lewis, L. W.				
Todd, R.	**SECOND CLASS.**	**SECOND CLASS.**	**SECOND CLASS.**	**SECOND CLASS.**
Johnson, C. W.	Corbett	Robertson	Todd	Marsily.
Corbett, P. J.	Coode	Laurie, G. C.	{Gahagan	{Finlaison
Gahagan, E. G.	Stotherd	Smith, E. A.	{Stotherd	{Streatfeild
White, J. H.	Lewis	Todd	Corbett, P. J.	Craven
Attfield, H. S.	Todd	Streatfeild	Streatfeild	Smith, E. A.
Hutton, W.	Morin	Johnson	Smith, E. A.	Willmott
Morin, A. H.	Laurie, G. C.	Lewis	Walton	Sawhny
Finlaison, H. G.	Smith, E. A.	Gahagan	Johnson	{Gahagan
Coode, C. L.	Gahagan	Corbett, P. J.	Laurie, G. C.	{Morin
Craven, L. B.	McIntosh	Attfield	Attfield	Todd
McIntosh, A.	Hutton	White	Lewis	Corbett, P. J.
Sawhny, B. R.	Finlaison	Sawhny	Hutton	Walton.
Judd, C. R.	Johnson	Coode	{Finlaison	Barlow
Barlow, T.	White	Hutton	{Sawhny	Berkeley
Borrero, V.	Judd	Craven	Craven	Coode.
Berkeley, A. M.	Attfield	{Finlaison	Coode	Judd
Boyle, J. C.	Craven	{Morin	Morin	White
	Robertson	Barlow	Borrero	Borrero
	Barlow	McIntosh	Berkeley	Boyle, J. C.
	Marsily	Judd	Judd	McIntosh
	Borrero	Borrero	Barlow	
	Sawhny	Berkeley	McIntosh	
	Boyle, J. C.	Boyle, J. C.	Boyle, J. C.	
	Berkeley			

TELEGRAPH COURSE.

Sutherland, W. | Truninger, L.

NOTE.—First Class Engineer Students hold the Diploma of Associate of Queen's College, Cork. Second Class Engineer Students, also Telegraph and Forest Students hold the Diploma of Qualification.

TWENTIETH SESSION.

ANNUAL EXAMINATIONS, JULY 1891—*Continued.*

ORDER IN MERIT.

SECOND YEAR.

ORDER IN GENERAL MERIT.

Lillie, G. E.
Lister, E. A. C.
Morres, J. L.
Laurie, A. C. H.
Meli, J.
Fleming, C. A.
Pearce, E. N.
Stirling, J. L.
Robertson, T. B.
Parker, J. M. M.
Benson, E. E. McG.
McMeekin, J. B. M.
Stuart, M. A. V.
Croslegh, L. C.
de Chazal, A. R.
Sibold, C. W
Thomas, W. M.
Wickham, P. F.
Bhore, J.
Betton, C. S.
Carnegie, D. W.
Polwhele, J. A.
Napier, G.
Wrey, G. B. S.

FOREST STUDENTS.

Leete, F. A.
Tulloch, J. C.
Carr, S.
Edie, H. S. K.
Hatt, C. C.
Trafford, F.
Fisher, W. F. D.
Napier, O. L. H.
Long, A. M.
O'Leary, J. L. McC.
Cowley-Brown, F. L. C.

BRANCH I. Engineering.

Morres
Laurie, A. C
Meli
M Meekin
Robertson, T. B.
Lillie
Sibold
Stirling
Fleming
Parker
Lister
Pearce
Croslegh
Stuart
Wickham
Benson
Betton
de Chazal
Bhore
Polwhele
Thomas
Carnegie
Napier, G.
Wrey

BRANCH II. Applied Mechanics.

Lillie
Fleming
Lister
Laurie, A. C.
McMeekin
Robertson, T. B.
Stirling
Pearce
Meli
Parker
Morres
de Chazal
Stuart
Croslegh
Benson
Sibold
Thomas
Wickham
Betton
Carnegie
Napier
Polwhele
Bhore
Wrey

BRANCH III. Mathematics.

FIRST CLASS.

Lister
Lillie
Benson
Parker

SECOND CLASS.

Croslegh
Thomas
Stirling
Morres
Pearce
Fleming
Robertson, T. B.
Meli
Laurie, A. C.
Stuart
de Chazal
Sibold
McMeekin
Bhore
Wickham
Polwhele
Carnegie

BRANCH IV. Natural Science.

Pearce
Fleming
de Chazal
Meli
Laurie, A. C.
Stirling
Lillie
Robertson, T. B.
Stuart
Morres
Lister
McMeekin
Parker
Benson
Croslegh
Bhore
Sibold
Wickham
Betton
Thomas
Polwhele
Napier
Carnegie
Wrey

FIRST YEAR.

ORDER IN GENERAL MERIT.

Coates, J.
Sullivan, W.
Smith, W. H.
Stapleton, B.
Kent, R. J.
Blaber, E.
Hall, C. E.
Gebbie, F. St. J.
Cheeke, W. A.
Montgomery, A. S.
Collins, F. B.
Stanton, W. C.
Longman, H. H.
McClean, J. B.
Gordon, G. H. H.
Corbet, A. R.
Hemsley, E. V.
Proes, E. M.
Furnivall, F.
Martin, E. S.
Foy, E. R.
Guyon, R. G.
Gully, J. L.
Armstrong, H. A.
Babington, S.
Beanfill, B.
Talbot, G. W.
Tonge, H. A.
Cross, L. D.
Staveley, A. G.
Varras, F. A.
Beale, A. G.
Manuk, J. T. A.

FOREST STUDENTS.

Billson, H. G.
Abbey, C. C.
Williamson, R. M.
Milward, R. C.
Linnell, F.
Latham, H. A.
Duxbury, G. R.
Smales, C. B.
Hanson, C. O.
Medivalla, G. C.
Wood, H. F. A.
Amin, K. C.
Cox, S.
Perrée, W. F.
Stebbing, F. P.
Tireman, H.
Lloyd, F. E. B.

TWENTY-FIRST SESSION.

ANNUAL EXAMINATIONS, JULY 1892.

APPOINTED FELLOWS OF COOPERS HILL.

LILLIE, G. E. LISTER, E. A. LAURIE, A. C.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

Scholar in Natural Science. (FOR THE WORK OF THREE YEARS.)

Scholarship presented by the Viscount Cross, Secretary of State for India.

PEARCE, E. N.

Fellows' Scholar. (FOR THE WHOLE THIRD YEAR COURSE.)

Scholarship presented by the Fellows of Coopers Hill.

LILLIE, G. E.

SECOND YEAR STUDENTS.

Foundation Scholar in Engineering. (FOR THE WORK OF TWO YEARS.)

Scholarship founded by the Civil Engineers of the Public Works Department.

PROES, E. M.

Scholar in Applied Mechanics. (FOR THE WORK OF THE SECOND YEAR.)

Scholarship of the Vice-President of the Council of India.

(STAPLETON, B.)* COATES, J.

President's Scholar in Mathematics. (FOR THE WORK OF TWO YEARS.)

STAPLETON, B.

Scholar in Forestry. (FOR THE WORK OF TWO YEARS.)

Scholarship of the Vice-President of the Council of India.

BILLSON, H. G.

FIRST YEAR STUDENTS.

Foundation Scholar. (FOR THE WHOLE FIRST YEAR COURSE.)

Scholarship founded by the Civil Engineers of the Public Works Department.

RIDDELL, W. J.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE in	*Descriptive Engineering*	McMEEKIN, J. B.
,,	*Applied Mechanics*	LILLIE, G. E.
,,	*Project and Designs—First Prize* .	McMEEKIN, J. B.
,,	,, *Second Prize* .	SIBOLD, C. W.
,,	*Accounts*	FLEMING, C. A.
,,	*Estimating*	MORRES, J. L.

* Disqualified by the rule precluding a student from holding more than one scholarship.

		Second Year Students.	First Year Students.
PRIZE in	*Descriptive Engineering*	Coates, J.	Kanthack, F. E.
,,	*Surveying*	Billson, H. G.	Bartlett, H. E. (*Acc.* Sangster, W. P.)
,,	*Architecture*	Gordon, G. H. H.	
,,	*Geometrical Drawing*	Proes, E. M.	Shoubridge, H. O. B. (*Acc.* Campbell, G. J.)
,,	*Freehand Drawing*		Molesworth, H. W.
,,	*Workshop Practice*	Branfill, B.	Ireland, G. B. P.
,,	*Mathematics*		Riddell, W. J.
,,	*Chemistry*		Thompson, M. A.
,,	*Geology*	Abbey, C. C.	Coventry, B. O.
,,	*Physics*	Billson, H. G.	Riddell, W. J. (*Acc.* Bartlett, H. E.)
,,	*Physical Laboratory*	Coates, J.	
,,	*Chemical Laboratory*		de Silva, W. C. / Coventry, B. O.
,,	*Forest Management*	Hanson, C. O.	
,,	*Botany*	Abbey, C. C.	Coventry, B. O.
,,	*Sylviculture*		Coventry, B. O.
,,	*Entomology*	Stebbing, E. P.	
,,	*Gymnastics*		Waghorn, J. D.

PASSED FOR THE INDIAN PUBLIC SERVICE, JULY 1892.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Lillie, G. E., *F.C.H.*	Morres, J. L.	Stirling, J. L.	**de Chazal, A. R.*
Lister, E. A., *F.C.H.*	Meli, J.	**McMeekin, J. B.*	**Sibold, C. W.*
Laurie, A. C., *F.C.H.*	**Pearce, E. N.*	Parker, J. M.	**Wickham, P. F.*
Fleming, C. A.	Robertson, T. B.	**Benson, E. E.*	

As Assistant Superintendents, Telegraph Department.

Armstrong, H. A. | Babington, S.

As Assistant Conservators, Forest Department, October 1891.

Leete, F. A.	Hatt, C. C.	Long, A. M.
Carr, S.	Trafford, F.	O'Leary, J. L. M.
Tulloch, J. C.	Fisher, W. F.	Cowley-Brown, F. L.
Edie, H. S.	Napier, O. L.	

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* Messrs. McMeekin and Benson declined their appointments, and Messrs. Pearce, Stuart, Croslegh, and Thomas were medically disqualified; Messrs. de Chazal, Sibold, and Wickham being accepted instead.

521+28=549

TWENTY-FIRST SESSION.

ANNUAL EXAMINATIONS, JULY 1892—*Continued.*

PASSED LIST, 1892.

THIRD YEAR.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
	FIRST CLASS.	**FIRST CLASS.**	**FIRST CLASS.**	**FIRST CLASS.**
Lillie, G. E.	Morres	Lillie	Lister	Pearce
Lister, E. A.	Meli	Fleming	Lillie	Fleming
Laurie, A. C.	McMeekin	Lister	Benson	Lillie
Fleming, C. A.	Laurie	Laurie	Parker	Laurie
Morres, J. L.	Sibold	Pearce		
*Meli, J.	Lillie	McMeekin		
*Pearce, E. N.		Robertson		
Robertson, T. B.		Meli		
Stirling, J. L.		Benson		
McMeekin, J. B.		Stirling		
Parker, J. M.	—		—	—
Benson, E. E.		—		
Stuart, M. A. V.				
de Chazal, A. R.				
*Croslegh, L. C.				
Sibold, C. W.				
Thomas, W. M.	**SECOND CLASS.**	**SECOND CLASS.**	**SECOND CLASS.**	**SECOND CLASS.**
Wickham, P. F.	Parker	Morres	Croslegh	de Chazal
Bhore, J.	Stirling	Parker	Thomas	Stirling
Polwhele, J. A.	Robertson	Stuart	Stirling	Robertson
	Fleming	de Chazal	Morres	Lister
	Lister	Sibold	Pearce	Stuart
	Pearce	Croslegh	Fleming	Benson
	Wickham	Wickham	Robertson	Meli
	Stuart	Thomas	Meli	Croslegh
	Croslegh	Polwhele	Laurie	Morres
	de Chazal	Bhore	Stuart	Bhore
	Thomas		de Chazal	McMeekin
	Benson		Sibold	Parker
	Bhore		McMeekin	Polwhele
	Polwhele		Bhore	Sibold
			Wickham	Wickham
			Polwhele	Thomas

TELEGRAPH COURSE.

Armstrong, H. A. | Babington, S.

* Absent from part of the Examinations.

NOTE.—First Class Engineer Students hold the Diploma of Associate of Coopers Hill. Second Class Engineer Students, also Telegraph and Forest Students, hold the Diploma of Qualification.

	Second Year Students.	First Year Students.
PRIZE *in Descriptive Engineering*	Campbell, G. J.	Rigg, H.
" *Surveying*	Campbell, G. J. / Molesworth, H. W.	Brooks, R.
" *Architecture*	Benwell, G. L.	
" *Geometrical Drawing*	Shoubridge, H. O. B.	Chapman, J. B.
" *Freehand Drawing*		Chapman, J. B.
" *Workshop Practice*	Ireland, G. B. P.	Beatson, E. B.
" *Mathematics*	McKenzie, A. L.	Hadow, F. A.
" *Chemistry*		Dassenaike, S. W.
" *Geology*	Coventry, B. O.	Dassenaike, S. W.
" *Physics*	Bartlett, H. E.	Dassenaike, S. W.
" *Physical Laboratory*	Riddell, W. J.	
" *Chemical Laboratory*		Piddocke, T. N.
" *Forest Management*	Bartlett, H. E.	
" *Botany*	Coventry, B. O.	Mayes, W.
" *Sylviculture*		Mayes, W.
" *General Merit, Telegraph Course*	Thompson, M. A.	
Athletic Championship	Sangster, W. P.	

(Prize presented by Viscount Cross.)

PASSED FOR THE INDIAN PUBLIC SERVICE, JULY 1893.

As Assistant Engineers, Second Grade. (*Order in Merit.*)

Coates, J., *F.C.H.*	Hall, C. E.	Blaber, E.
Stapleton, B., *F.C.H.*	Gebbie, F. St. J.	Furnivall, F.
Sullivan, W.	Kent, R. J.	Collins, F. R.
Smith, W. H.	Montgomery, A. S.	Stanton, W. C.

As Assistant Superintendents, Telegraph Department.

Thompson, M. A. | Overton, J. J. R. | Pike, H. S.

As Assistant Conservators, Forest Department, July 1893.

Billson, H. G., *F.C.H.*	Linnell, F.	Perrée, W. F.	Wood, H. F. A.
Abbey, C. C., *F.C.H.*	Hanson, C. O.	Smales, C. B.	Tireman, H.
Williamson, R. M.	Duxbury, G. R.	Cox, S.	Lloyd, F. E. B.
Millward, R. C.	Latham, H. A.	Stebbing, E. P.	

TWENTY-SECOND SESSION.

ANNUAL EXAMINATIONS, JULY 1893—*Continued.*

PASSED LIST, 1893.

THIRD YEAR—ENGINEER STUDENTS.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
	FIRST CLASS.	**FIRST CLASS.**	**FIRST CLASS.**	**FIRST CLASS.**
Coates, J.	Proes	Coates	Stapleton	Coates
Stapleton, B.	Kent	Stapleton	Smith	Hall
Sullivan, W.	Gebbie		Sullivan	
Smith, W. H.	Foy		Coates	
Hall, C. E.	Blaber			
{ Gebbie, F. St. J.	Montgomery	**SECOND CLASS.**	**SECOND CLASS.**	**SECOND CLASS.**
{ Kent, R. J.		Smith	Hall	Sullivan
Montgomery, A. S.	**SECOND CLASS.**	Sullivan	Longman	Collins
Blaber, E.	Stanton	Furnivall	Collins	Kent
Furnivall, F.	Smith	Kent	Hemsley	Montgomery
Collins, F. R.	Hall	Gebbie	Furnivall	Corbet
Stanton, W. C.	Furnivall	Hall	{ Gebbie	Longman
Proes, E. M.	Stapleton	Collins	{ Kent	Smith
Martin, E. S.	Coates	Montgomery	Montgomery	Gebbie
Foy, E. R.	Sullivan	Blaber	Blaber	Blaber
Corbet, A. R.	Martin	Martin	Stanton	Stanton
Gordon, G. H.	Gordon	Stanton	Martin	Stapleton
* Longman, H. H.	Collins	Proes	Gordon	Gordon
Hemsley, E. V.	Guyon	Guyon	Proes	Hemsley
Guyon, R. G.	Corbet	Corbet	Corbet	Guyon
	Longman	Longman	Guyon	Furnivall
Re-examined in Branch III. from previous year.	Hemsley	Hemsley	Foy	Foy
	Longman	Gordon	*Re-examined.*	Martin
Napier, G.		Foy	Napier, G.	Proes

THIRD YEAR—FOREST STUDENTS.

ORDER IN GENERAL MERIT.	BRANCH I. Auxiliary Subjects.	BRANCH II. Forestry.
Billson, H. G.	Billson	Abbey
Abbey, C. C.	Abbey	Williamson
Williamson, R. M.	Millward	Hanson
Milward, R. C.	Williamson	Billson
Linnell, F.	Latham	Linnell
Hanson, C. O.	Linnell	Duxbury
Duxbury, G. R.	Hanson	Millward
Latham, H. A.	Duxbury	Latham
Medivalla, G. C.	Smales	Cox
Perrée, W. F.	Medivalla	Perrée
Smales, C. B.	Perrée	Medivalla
Cox, S.	Stebbing	Stebbing
Stebbing, E. P.	Cox	Smales
Amin, K. C.	Amin	Wood
Wood, H. F. A.	Wood	Amin
Tireman, H.	Tireman	Tireman
Lloyd, F. E. B.	Lloyd	Lloyd

TELEGRAPH COURSE.

Thompson, M. A. | Overton, J. J. R. | Pike, H. S.

* Absent from part of the Examinations.

NOTE.—First Class Students hold the Diploma of Associate of Coopers Hill. Second Class Engineer Students, also Telegraph and Forest Students, hold the Diploma of Qualification.

TWENTY-SECOND SESSION.

ANNUAL EXAMINATIONS, JULY 1893—*Continued.*

ORDER IN MERIT.

SECOND YEAR—ENGINEER STUDENTS.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
Riddell, W. J.	Sangster	Young	**FIRST CLASS.**	Riddell
Campbell, G. J.	Benwell	McKenzie		Kanthack
Young, J. A. F.	Campbell	Kanthack	Riddell	Young
Kanthack, F. E.	Shoubridge	Riddell	McKenzie	Camgbell
McKenzie, A. L.	Hawkins	Campbell	Young	Duggan
Sangster, W. P.	Riddell	Sangster	Campbell	Shoubridge
Shoubridge, H.O.B.	Kanthack	Hawkins	Kanthack	Dowrie
Kharegât, M. R.	Samuelson	Edge		Sangster
Dowrie, G. A.	Hackman	Pope		Edge
Benwell, G. L.	Ireland	Shoubridge		Kharegât
Pope, H. N.	McKenzie	Benwell		Hawkins
Williams, S. M. J.	Molesworth	Samuelson		McKenzie
Hawkins, F.	Ede	Griess		Benwell
Samuelson, B. M.	Young	Duggan		Pope
Edge, R. C.	Dowrie	Kharegât		Samuelson
Ireland, G. B. P.	Duggan	Dowrie		Ireland
Duggan, C. R.	Pope	Ireland		Williams
Molesworth, H. W.	Williams	Williams		Ede
Hackman, W. F.	Edge	Sen	**SECOND CLASS.**	Lankester
Jones, W. S.	Kharegât	Flint		Hackman
Ede, H. B.	Jones	Waghorn	Kharegât	Boath
Waghorn, J. D.	Waghorn	Boalth	Sangster	Mulholland
Flint, J.	Lankester	Hackman	Sen	Jones
Griess, W. M.	Boalth	Jones	Dowrie	Griess
Mulholland, W.	Etlinger	Mulholland	Shoubridge	Waghorn
Sen, R. C.	Griess	Molesworth	Williams	Sen
Boalth, V. H.	Mulholland	Ede	Pope	Molesworth
Lankester, W. B.	Flint	Etlinger	Samuelson	Etlinger
Etlinger, T. E.	Tottenham	Lankester	Benwell	Bertier
Tottenham, F. M.	Allcroft	Tottenham	Bertier	Tottenham
Bertier, E. N.	Elmsley	Allcroft	Flint	Flint
Allcroft, W. L.	Sen	Bertier	Edge	Allcroft
Elmsley, S. R.	Bertier	Elmsley	Hawkins	Elmsley
			Ireland	
			Mulholland	
			Griess	
			Duggan	
			Hackman	
			Boalth	
			Molesworth	
			Jones	
			Waghorn	
			Tottenham	
			Etlinger	

SECOND YEAR—FOREST STUDENTS.

ORDER IN GENERAL MERIT.	BRANCH I. Auxiliary Subjects.	BRANCH II. Forestry.
Coventry, B. O.	Coventry	Coventry
Bartlett, H. E.	Bartlett	Bartlett
Farrington, H. A.	Farrington	Chaplin
Tennant, C. H.	Tennant	Tennant
Copleston, W. E.	Copleston	Lawson
Chaplin, W. H.	Chaplin	Farrington
Grieve, J. W. A.	Grieve	Grieve
Lawson, M.	Beechey	Batchelor
Beechey, A. St. V.	Lawson	Beechey
Thomson, D. A.	Thomson	Thomson
Batchelor, W. W.	Batchelor	Copleston

FIRST YEAR.

ORDER IN GENERAL MERIT.
Dassenaike, S. W.
Brooks, R.
Lovell, J. H.
Murray, A. R.
Hutchinson, H. W.
Hadow, F. A.
Lutman, J. B.
Chapman, J. B.
Radcliffe, R. C. J.
Rigg, H.
Mullings, C. T.
Huntingford, G. T.
Young, M. C. G.
Roy, G. P.
Piddocke, T. N.
Fraser, A.
Talbot, G. W.
Landon, G. E.
Brown, M.
Mooraj, F. G.
Davidson, N.
Nicholson, E.
Beatson, E. B.
Jones, F. M.
Velez, T. M.
Casilagli, A.
John, W. C.
Taylor, H. E.

FOREST STUDENTS.

Mayes, W.
McIrie, C. M.
Dodgson, J.
Kenny, L. S.
Spencer, H. H.
Ross, A. E.
Edie, A. G.
McNaughton, C. B.
Doveton, C. W.
Fischer, C. E. C.
Dicks, A. R.
Arbuthnot, H. F.

* Absent from part of the Examinations.

TWENTY-THIRD SESSION.

ANNUAL EXAMINATIONS, JULY 1894.

APPOINTED FELLOWS OF COOPERS HILL.

RIDDELL, W. J. CAMPBELL, G. J. YOUNG, J. A. F. COVENTRY, B. O.

SCHOLARSHIPS.

THIRD YEAR STUDENTS.

Scholar in Natural Science. (FOR THE WORK OF THREE YEARS.)

Scholarship presented by the Right Hon. H. H. Fowler, M.P., Secretary of State for India.

RIDDELL, W. J.

Fellows' Scholar. (FOR THE WHOLE THIRD YEAR COURSE.)

Scholarship presented by the Fellows of Coopers Hill.

CAMPBELL, G. J.

Scholar in Applied Mechanics. (FOR THE WORK OF THE THIRD YEAR.)

Scholarship of the Vice-President of the Council of India.

YOUNG, J. A. F.

SECOND YEAR STUDENTS.

Foundation Scholar in Engineering. (FOR THE WORK OF TWO YEARS.)

Scholarship founded by the Civil Engineers of the Public Works Department.

HUTCHINSON, H. W.

Scholar in Applied Mechanics. (FOR THE WORK OF THE SECOND YEAR.)

Scholarship of the Vice-President of the Council of India.

LOVELL, J. H.

President's Scholar in Mathematics. (FOR THE WORK OF TWO YEARS.)

HADOW, F. A.

Scholar in Forestry. (FOR THE WORK OF TWO YEARS.)

Scholarship of the Vice-President of the Council of India.

MAYES, W.

FIRST YEAR STUDENTS.

Foundation Scholar. (FOR THE WHOLE FIRST YEAR COURSE.)

Scholarship founded by the Civil Engineers of the Public Works Department.

HURLEY, F. A.

PRIZEMEN.

THIRD YEAR STUDENTS.

PRIZE in	*Descriptive Engineering*	BENWELL, G. L.
,,	*Applied Mechanics*	*[YOUNG, J. A. F.] . RIDDELL, W. J.
,,	,, (*Construction*)	McKENZIE, A. L.
,,	*Project and Designs—First Prize*	SANGSTER, W. P.
,,	*Second Prize*	CAMPBELL, G. J.
,,	,,	McKENZIE, A. L.
,,	*Accounts*	SANGSTER, W. P.
,,	*Estimating*	COVENTRY, B. O.
,,	*Forestry—First Prize*	FARRINGTON, H. A.
,,	,, *Second Prize*	TENNANT, C. H.
,,	*Entomology*	

		SECOND YEAR STUDENTS.	FIRST YEAR STUDENTS.
PRIZE in	*Descriptive Engineering*	LOVELL, J. H.	ADDIS, R. B.
,,	*Surveying*	HUTCHINSON, H. W.	ADDIS, R. B.
,,	*Architecture*	RADCLIFFE, R. C. J.	
,,	*Geometrical Drawing*	BROOKS, R.	ADDIS, R. B.
,,	*Freehand Drawing*		MONTEATH, T. H.
,,	*Workshop Practice*	BEATSON, E. B.	McGUFFIE, D. W.
,,	*Applied Mechanics*	*[LOVELL, J. H.] DASSENAIKE, S. W.	
,,	*Mathematics*	DASSENAIKE, S. W.	HURLEY, F. A.
,,	*Chemistry*		HURLEY, F. A.
,,	*Geology*	DASSENAIKE, S. W.	WILLIAMS, J. K.
,,	*Physics*	DASSENAIKE, S. W.	HURLEY, F. A.
,,	*Physical Laboratory*	NICHOLSON, E.	
,,	*Chemical Laboratory*	PIDDOCKE, T. N.	ADDIS, R. B.
,,	*Forest Management—First Prize*	MAYES, W.	
,,	,, *Second Prize*	McCRIE, C. M.	
,,	*Entomology*	MAYES, W.	
,,	*Botany*	MAYES, W.	HOLE, R. S.
,,	*Sylviculture*		DOXAT, W. A. R.
,,	*Gymnastics*		MONTEATH, T. H.

PASSED FOR THE INDIAN PUBLIC SERVICE, JULY 1894.

As Assistant Engineers, Third Grade. (*Order in Merit.*)

Riddell, W. J., *F.C.H.*	Sangster, W. P.	†*Pope, H. N.*
†*Campbell, G. J., F.C.H.*	Shoubridge, H. O. B.	Samuelson, B. M.
Young, J. A. F., *F.C.H.*	Benwell, G. L.	Kharegát, M. R.
McKenzie, A. L.	Dowrie, G. A.	†*Edge, R. C.*
Kanthack, F. E.		

As Assistant Engineers, Telegraph Department.

Landon, G. E.	Roy, G. P.	*Talbot, G. W.*

As Assistant Conservators, Second Grade, Forest Department.

Coventry, B. O., *F.C.H.*	Tennant, C. H.	Batchelor, W. W.
Bartlett, H. E.	Thomson, D. A.	Grieve, J. W. A.
Farrington, H. A.	Beechey, A. St. V.	Lawson, M.
Copleston, W. E.		

* Having obtained the Scholarship, is not entitled to the Prize also.
† Mr. Campbell was disqualified medically, but his case was referred by the Secretary of State to the Government of India, who accepted him for Public Works outside of the Railway Branch. Mr. Pope declined the appointment, and Mr. Edge was taken instead. Mr. Talbot failed to qualify, but was accepted after re-examination in September.

TWENTY-THIRD SESSION.

ANNUAL EXAMINATIONS, JULY 1894—*Continued.*

PASSED LIST, 1894.

THIRD YEAR—ENGINEER STUDENTS.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
	FIRST CLASS.	**FIRST CLASS.**	**FIRST CLASS.**	**FIRST CLASS**
Riddell, W. J.	Sangster	Young	Riddell	Riddell
Campbell, G. J.	Campbell	Riddell	McKenzie	Kanthack
Young, J. A. F.	Benwell	McKenzie	Young	Young
McKenzie, A. L.	Shoubridge	Campbell	Campbell	
Kanthack, F. E.	Samuelson	Kanthack	Kanthack	
Sangster, W. P.	Hawkins			**SECOND CLASS.**
Shoubridge, H. O. B.				Duggan
Benwell, G. L.	**SECOND CLASS.**	**SECOND CLASS.**	**SECOND CLASS.**	McKenzie
Dowrie, G. A.	Dowrie	Edge	Kharegát	Pope
Pope, H. N.	Riddell	Hawkins	Sangster	Campbell
Samuelson, B. M.	Molesworth	Sangster	Dowrie	Shoubridge
Kharegát, M. R.	McKenzie	Benwell	Shoubridge	Dowrie
Edge, R. C.	Kanthack	Shoubridge	Williams	Sangster
*Hawkins, P.	Ireland	Samuelson	Pope	Edge
Williams, S. M. J.	Edge	Griess	Samuelson	Kharegát
Duggan, C. R.	Hackman	Pope	Benwell	Hawkins
Ireland, G. B. P.	Young	{Dowrie	Bertier	Benwell
Molesworth, H. W.	{Pope	{Williams	Flint	Samuelson
Waghorn, J. D.	{Williams	Kharegát	Edge	Ireland
Hackman, W. F.	Waghorn	Duggan	Hawkins	Williams
Griess, W. M.	Duggan	Ireland	Ireland	Hackman
Jones, W. S.	Kharegát	Molesworth	Mulholland	{Boalth
Flint, J.	Jones, W. S.	Boalth	Griess	{Mulholland
Boalth, V. H.	Boalth	Waghorn	Duggan	Jones, W. S.
Mulholland, W.	Griess	Flint	Hackman	Flint
Etlinger, T. E.	Etlinger	Hackman	Boalth	Griess
Tottenham, P. M.	Flint	Etlinger	Molesworth	Waghorn
Bertier, E. N.	Mulholland	Jones, W. S.	Jones, W. S.	Molesworth
	Tottenham	Mulholland	Waghorn	Bertier
	Bertier	Tottenham	Tottenham	Tottenham
		Bertier	Etlinger	Etlinger
			Re-examined from previous year.	*Re-examined from previous year.*
			Staveley, A. G.	Cross, L. D.

THIRD YEAR—FOREST STUDENTS.

ORDER IN GENERAL MERIT.	BRANCH I. Auxiliary Subjects.	BRANCH II. Forestry.
Coventry, B. O.	Coventry	Coventry
Bartlett, H. E.	Bartlett	Farrington
Farrington, H. A.	Tennant	Bartlett
Copleston, W. E.	Copleston	Copleston
Tennant, C. H.	Farrington	Batchelor
Thomson, D. A.	Grieve	Thomson
Beechey, A. St. V.	Beechey	Beechey
Batchelor, W. W.	Thomson	Tennant
Grieve, J. W. A.	Batchelor	Lawson
Lawson, M.	Lawson	Grieve

TELEGRAPH COURSE.

Landon, G. E. | Roy, G. P.

* Absent from part of the Examinations.

NOTE.—First Class Students hold the Diploma of Associate of Coopers Hill. Second Class Engineer Students, also Telegraph and Forest Students, hold the Diploma of Qualification.

TWENTY-THIRD SESSION.

ANNUAL EXAMINATIONS, JULY 1894—*Continued.*

ORDER IN MERIT.

SECOND YEAR—ENGINEER STUDENTS.

ORDER IN GENERAL MERIT.	BRANCH I. Engineering.	BRANCH II. Applied Mechanics.	BRANCH III. Mathematics.	BRANCH IV. Natural Science.
Dassenaike, S. W.	Hutchinson	Lovell	**FIRST CLASS.**	Dassenaike
Lovell, J. H.	Lovell	Dassenaike	Hadow	Piddocke
Brooks, R.	Brooks	Hadow	Dassenaike	Murray
Murray, A. R.	Rigg	Brooks	Brooks	Lovell
Hadow, F. A.	Brown	Rigg	Murray	Lutman
Hutchinson, H. W.	Chapman	Murray	Lovell	Hutchinson
Rigg, H.	Dassenaike	Hutchinson		Chapman
Chapman, J. B.	Murray	Chapman		Brooks
Radcliffe, R. C. J.	Radcliffe	Huntingford		Rigg
Lutman, J. B.	Huntingford	Piddocke		Hadow
Huntingford, G. T.	Young	Young		Young
Piddocke, J. N.	Nicholson	Mooraj		Radcliffe
Mullings, C. J.	Hadow	Lutman		Brown
Young, M. C. G.	Piddocke	Brown		Mooraj
Brown, M.	Lutman	Nicholson		Huntingford
Nicholson, E.	Beatson	Radcliffe		Jones
Mooraj, F. G.	Mullings	Jones, F. M.		Mullings
Beatson, E. B.	Mooraj	Mullings		Nicholson
Jones, F. M.	Jones, F. M.	Beatson		Beatson
			SECOND CLASS.	
			Mullings	
			Radcliffe	
			Hutchinson	
			Huntingford	
			Rigg	
			Lutman	
			Mooraj	
			Young	
			Piddocke	
			Chapman	
			Nicholson	
			Brown	

SECOND YEAR—FOREST STUDENTS.

ORDER IN GENERAL MERIT.	BRANCH I. Auxiliary Subjects.	BRANCH II. Forestry.
*Mayes, W.	Mayes	Mayes
McCrie, C. M.	McCrie	McCrie
Kenny, L. S.	Kenny	Kenny
Dodgson, J.	Dodgson	Dodgson
Spencer, H. H.	Spencer	Spencer
Dicks, A. R.	Ross	Dicks
Ross, A. E.	Dicks	Edie
Edie, A. G.	Fischer	Ross
Fischer, C. E. C.	Edie	Doveton
Doveton, C. W.	Doveton	Arbuthnot
Arbuthnot, H. F.	Arbuthnot	Fischer

FIRST YEAR.

ORDER IN GENERAL MERIT.
Hurley, F. A.
Addis, R. B.
Sisson, W. A. C.
Ross, W. C.
Stuart, J. D.
Dawson, G. F.
Bucknill, W. B.
Turkhud, D. A.
Williams, J. K.
McGuffie, D. W.
Anderson, T. C.
Lowis, F. C.
Campbell, A. W.
Tulloch, C. A.
Goodall, C.
Molesworth, W. G.
Bell, G. H.
Velez, J. M.
Babington, C. D. deV.
Casdagli, A.
Yeates, P. K.
Clarke, H. O.
John, W. C.
Crookes, L. P.
Gale, W. H.
Davie, W. G.
Heinemann, S. O.

FOREST STUDENTS.

Hole, R. S.
Cobitt, G. E. S.
Witt, D. O.
Channer, F. F. E.
Parker, G. K.
Doxat, W. A. R.
Hodgson, E. M.
Scot, J. S.
Monteath, T. H.
Carroll, J. C.
Dawson, C. B.

* Absent from part of the Examinations.

ALPHABETICAL LIST OF PASSED STUDENTS OF THE COLLEGE NOW SERVING IN THE PUBLIC WORKS TELEGRAPH AND FOREST DEPARTMENTS OF INDIA.

Corrected to 31st December 1893.

[The Names in CAPITALS are of Fellows of Coopers Hill (*F.C.H.*).]

Year of Appointment.	NAMES.	Year of Appointment.	NAMES.	Year of Appointment.	NAMES.
1893	ABBEY, C. C., *F.C.H.*	1878	Bird, W. J. A.	1889	Cochem , A. E.
1885	ADAM, J., *F.C.H.*	1893	Blaber, E.	1876	Cole, W. H.
,,	Aikman, D. W.	1888	Blunt, A. W.	1879	Cole, C. J.
1880	ALEXANDER, E. J., *F.C.H.*	1875	Boase, J. T.	1874	Colebrooke, H. W. V.
		1889	Bose, L. M.	1874	Coles, G. E.
1882	Ali Akbar	1880	Bowden, H. J. A.	1879	Collet, J. F. H.
,,	Allen, P. R.	1877	BOYCE, H. G., *F.C.H.*	1893	Collins, F. R.
1874	Allen, W. G.	1888	Branthwaite, F. J.	1878	Cones, J. A.
1875	Anderson, G. A.	1872	Brodie, W. P.	1890	Coo, C. W.
1892	Armstrong, H. A.	1878	Brooke, J. H.	1885	Coode, J. M.
1881	Arnott, M. H.	1875	Brown, J. S.	1876	Coode, M. P.
1874	ARUNDELL, E. W., *B.A. F.C.H.*	1889	Bruce, C. W. A.	1891	Corbett, P. J.
		1890	Bryant, H. B.	1886	Couchman, F.
1880	Ash, H. R. F.	1889	Bull, F. E.	1889	COUTTS, E. G., *.C.H.*
1882	Ashpitel, F. W.	1875	Burlton, C. H. B.	1890	Coventry, E. M.
1876	Atkinson, R. P.	1884	Burne, O.	1890	Cowley, F. A.
1892	Babington, S.	1890	Burn-Murdock, A. M.	1891	Cowley-Brown, F.L.C.
1883	BACON, H. M. J., *F.C.H.*	1878	Burt, H. P.	1875	Cowper, G.
		1879	Butler, T.	1881	Cox, S.
1888	Bäder, F. R.	1889	Caccia, A. M.	1893	Cox, S.
1876	Baker, C. J. S.	1877	Cameron, W. L. S. L.	1874	Crampton, A. C.
1876	Baker, E.	1875	Carless, G. P.	1889	Cuffe, O. F.
1875	Baker, H. V. S.	1885	Carne, F. W.	1887	CURRIE, H.A.F., *F.C.H.*
1888	Baines, H. M.	1891	CARR, S., *F.C.H.*	1875	Curry, T. E.
1879	Barker, R. C.	1874	Carswell, E. A.	1880	Curry, W. E.
1886	Barlow, G. T.	1888	Carter, H.	1876	Dallas, J. E.
1882	Barlow, H.	1880	Carter, R. E.	1877	Dashwood, F. A.
1885	Barnes, R.	1889	Cather, G. F. H.	1874	Davidson, J. P.
1878	Barratt, C. H.	1878	CHADWICK, W., *F.C.H.*	1890	Davie, W. G.
1882	Barrow, W. D.	1877	Chanter, F. W.	1878	Dawson, E. F.
1882	Beale, H. F.	1883	Chappel, H. E.	1889	Dawson, F. G. R.
1890	Belcher, W. E. G.	1881	Chirnside, J. B.	1875	Day, C. E.
1888	BELL, A. E. S., *F.C.H.*	1882	Clark, C. C. S.	1877	De Brath, S.
1875	Bellasis, E. S.	1888	CLAYTON, F., *F.C.H.*	1892	De Chazal, A. R.
1873	BENTON, J., *F.C.H.*	1886	Cleaver, H. L.	1874	De Morgan, W. C.
1878	Bennett, H. W.	1876	CLEMENTSON, E. H.	1878	Dempster, F. E.
1885	Beresford, G. C.	1880	Clerk, H. E.	1877	Denne, R. T.
1878	Berrington, T. D. D.	1876	Clifton, C. N.	1884	Despeissis, J. M. A.
1876	Bewley, A.	1883	Clowes, T. H.	1881	DEUCHARS, G., *F.C.H.*
1875	Bickerton, C. H. C.	1889	Clutterbuck, P. H.	1883	Devenish, J. A.
1893	BILLSON, H. G., *F.C.H.*	1893	COATES, J., *F.C.H.*	1874	de Winton, W. B.

Year of Appointment.	NAMES.
1878	de Winton, T. W.
1880	Donnan, J.
1882	Douglass, R.
1881	Drew, W.
1876	Dunn, G. O. W.
1893	Duxbury, G. R.
1888	DUPUIS, C. E., *F.C.H.*
1880	DYSON, R. C., *F.C.H.*
1883	Eaton, J. N. A.
1891	Edie, H. S. K.
1878	Egerton, R. W.
1887	Eldridge, H. J.
1882	Elrington, R.
1877	English, R. A.
1882	Eve, J. F. S.
1879	Fagan, A. M.
1880	Faulkner, E. T.
1874	Finney, S.
1881	Finnimore, B. K.
1891	Fisher, W. F. D.
1880	Fitzgibbon, P. J.
1892	Fleming, C. A.
1879	Foord, A. M.
1880	Foord, A. W.
1875	Forsyth, J. H. P.
1890	Forteath, H. H.
1890	Foulkes, G. F.
1877	Fox, H.
1878	Fowler, F. D.
,,	Fraser, E. G.
1879	Fraser, L. R.
1879	Frost, H. F. B.
1893	Furnivall, F.
1888	Gabbett, E.
1877	Gabbett, J. E.
1891	Gahagan, E. G.
1887	Gale, A. B.
1886	GALES, R. R., *F.C.H.*
1881	Gardiner, E. R.
1874	Garrett, A. H.
1893	Gebbie, F. St. J.
1877	George, D.
1886	Gibbs, R. T.
1875	Gilbert, C. F.
1881	Giles, W.
1885	Gilliland, P. W.
1886	Goodall, H. C. A.
1874	Goodfellow, A. T.
1879	Gordon, W. B.
1880	Grant, A.
1883	Green, H. H.
1889	Grenfell, A. P.
1890	Griffin, J. V.
1885	Grimes, A. J. L.
1880	Guinness, H. S.
1876	Haddon, H. E., *B.A.*
,,	Haig, W. S.
1888	HAINES, H. H., *F.C.H.*
1893	Hall, C. E.
1881	Handcock, G. F.
,,	Handcock, W. E. F.
1875	Handley, J. H.
1893	Hanson, C. O.
1875	Harington, H. S.
,,	Harris, G. S. T.
1878	Harris, F.
1876	Harrison, A. G.
1882	Harrison, G. McC.
1887	Hart, G. S.
1890	Harvey, F. J.
1891	Hatt, C. C.
1875	Hatten, J. J., *B.A.*
1879	Hayes, A. M.
1891	HEAP, J. H., *F.C.H.*
1887	Heaton, B.
1879	Heaven, F. G.
1874	Hebbert, F. B.
1877	Hebbert, H. L.
1879	Henderson, J. P.
1888	Henderson, W. P.
1878	Hensley, J. W.
1879	Herbert, D. W.
1890	Hervey, F. J.
1885	Hewitt, J. C.
1877	Hewitt, St. J.
1877	Hight, A. E.
1879	HILL, A., *F.C.H.*
1880	Hill, A. P.
1877	Hill, C.
1887	Hill, M.
1890	Hodgson, C. M.
1873	Hodson, C. W.
1876	Holme, C. H.
1888	Holms, W. F.
1877	Home, W.
1874	HORN, D. B., *F.C.H.*
1888	Howard, W. H. K.
1889	Howley, W. T.
1888	Hudson, E. J. B.
1881	Hutton, C. H.
1891	Hutton, W.
1882	Inglis, J.
1874	Inglis, W. A.
1877	Ivens, J. H. A.
1889	Jackson, A. B.
1881	Jackson, M. H.
1876	Jacob, E. F.
1875	Jacob, L. M.
1886	Jacobs, P. G.
1878	James, C. S.
1889	Jenkins, W.
1884	John, H. C. R.
1876	Johns, E. H.
1880	Johns, W. A.
1891	Johnson, C. W.
1880	Johnston, H. J.
1887	Jones, H. C.
1883	Jones, H. S.
1877	Jopp, W.
1874	Joyce, A.
1887	Keeling, H. T.
1881	Kemball, H. V. R.
1879	Kench, H.
1873	Kennedy, R. G.
1893	Kent, R. J.
1880	Kenyon, E. A.
1875	Knapp, C. C. B.
,,	Knox, H. C.
1877	Lambert, G. B.
1880	Landon, H. J.
1876	Lang, F.
1879	Lang, R. D. M.
1893	Latham, H. A.
1880	La Touche, J. N. D.
1892	LAURIE, A. C., *F.C.H.*
1891	Laurie, G. C.
1880	Lee, E. A.
1877	Leefe, C. O.
1878	Lees, O. C.
1879	Lees, R. O.
1891	LEETE, F. A., *F.C.H.*
1881	Le Maistre, G. H.
1876	Le Quesne, W. H.
1875	Leslie, M.
1889	Leslie, N. U. K.
1879	Leventhorpe, A.
1877	Leventhorpe, J. B.
1876	Lewis, W. C.
1891	Lewis, L. W.
1881	Light, L. A.
1892	LILLIE, G. E., *F.C.H.*
1893	Linnell, F.
1892	LISTER, E. A. C., *F.C.H.*

Year of Appointment.	NAMES.
1888	Lloyd, C. V.
1889	Lloyd, W. F.
1893	Lloyd, F. E. B.
1886	Loam, M.
1884	Long, J. S. L.
1889	Long, G. R.
1891	Long, A. M.
1889	Lovegrove, W. H.
,,	Lugard, E. A.
1885	Lyle, J. C.
1888	McArthy, C. D'A.
1889	McHarg, W. T. T.
1887	MacCarthy, A. H. C.
1879	Macdonald, A. R.
1881	Mackenzie, A. T.
1878	Mackenzie, N. F.
1883	MacMillan, H.
1880	Maconchy, G. C.
1879	Madge, P. M.
1887	Mahon, G.
1877	Malet, A. A. G.
,,	Manson, G. E.
1880	Manson, J.
1881	Marjoribanks, C.H.D.
1874	Marsh, H.
1890	Marshall, D.
1878	Mason, A. H.
1879	Mathews, H. M. S.
1881	Maunsell, F. W.
1887	Mawson, E. O.
1890	Mayston, H.
,,	McIntosh, R.
1878	McLeod, N. F.
1881	Medlicott, J. H.
1892	Meli, J.
1878	Menneer, R. R.
1884	Mercer, F.
1889	Meredith, R.
1890	Messer, J.
1875	Michell, T.
1876	Michell, W.
1887	Mildred, C.
1873	Mills, C. A.
1880	Mills, G.
1881	Mills, J. C.
1889	Mills, W. H.
1893	Millward, R. C.
1874	Molloy, R. A.
1888	Monro, A. V.
1876	Montague, J. M., *B.A.*
1893	Montgomery, A. S.
1891	Morin, A. H.
1877	Morley, G. S.
1892	Morres, J. L.
1878	Morse, A.
1885	Moss, H. A.
1875	Moyle, G.
1874	Mullaly, J. J.
1884	Murray, S. B.
1883	Napier, Hon. H. E. S.
1891	Napier, O. L. H.
1885	Nathan, W.
1880	Nethersole, M.
1874	Newcombe, A.C., *B.A.*
1877	Newham, W. E.
1876	Newton, W. G.
1878	Nicolls, J. R. C.
1881	O'Brien, C. J.
1888	O'Bryen, E. A.
1878	O'Connell, H. H.
1876	Oddie, H. J.
1890	O'Hara, J. G. M.
1891	O'Leary, J. L. McC.
1887	Oliver, E. G.
1880	Olphert, H. S.
1883	Orr, A. E.
1888	Osmaston, B.B., *F.C.H.*
1890	Osmaston, L. S.
1893	Overton, J. J. R.
1878	Palmer, A. L.
1874	Pargiter, E. H.
1892	Parker, J. M.
1874	Parkes, B., *B.E.*, *F.C.H.*
1875	Parry, J. W.
1890	Paterson, R. S.
1875	Paul, J. E.
1880	Pears, S. D.
1879	Pedley, W. E.
1883	Pellereau, H. E.
1874	Penny, E.
1880	Perceval, R. D.
1885	Pereira, A. C.
1893	Perrée, W. F.
1874	Perrin, C.
1881	Phelips, H. V. M.
1882	Phillips, H.
1893	Pike, H. S.
1876	Pinhey, E.
1878	Pinhey, H. T.
1884	Polwhele, A. C.
1878	Pope, F. J.
,,	Price, P. L. A.
,,	Prickett, L. G., *F.C.H.*
1881	Raven, P. E.
1878	Rawson, F.
1875	Rebsch, S.
1890	Reid, R. N. H.
1877	Reilly, F., *F.C.H.*
1886	Reilly, Francis.
1881	Rennick, C. S.
1875	Reynolds, G. B.
1891	Richards, G., *F.C.H.*
1878	Ritchie, A. S. M.
1876	Roberts, R.W., *F.C.H.*
1884	Robertson, L. F.
1891	Robertson, H. C.
1892	Robertson, T. B.
1879	Roden, H. H.
1887	Rogers, C. G., *F.C.H.*
1889	Romilly, A.G.
1886	Rose, F. C.
1877	Rose, G. P.
1876	Routh, R. S. J.
1883	Rowland, A.
1882	Rowland, R. W.
,,	Rushton, W. H.
1875	Russell, A. S.
1882	Russell, R. P.
1882	Sanders, H. C.
1877	Savielle, G. A.
1879	Savory, H. G. S.
1881	Scobie, D. M.
1876	Scobie, M. J.
1879	Scott, F. W. M.
1885	Scovell, C. T. R.
1880	Scratchley, A. J.
1885	Scaright, G. L.
1888	Sen, P. N.
1874	Shadbolt, E. I.
1875	Sharp, F.
1874	Shawe, G. A. G.
1880	Shaw, W. R.
1877	Shedlock, O. J.
1885	Shepard, A. W.
1892	Sibold, C. W.
1882	Silk, A. E.
1876	Simeon, L. B.
1887	Simpson, M. G.
1876	Sivewright, R.
1893	Smales, C. B.

Year of Appointment.	NAMES.	Year of Appointment.	NAMES.	Year of Appointment.	NAMES.
1880	Smith, C. A.	1874	Tait, J.	1881	Weightman, W. J.
1875	Smith, C. M.	1887	Tayler, F. V.	,,	White, C. A.
1889	Smith, C. M.	1882	TAYLOR, H.B., *F.C.H.*	1891	White, J. H.
1879	Smith, H. W.	1877	Tebbs, F. R.	1881	Whiteley, J. J.
,,	Smith, F. St. G. M.	1881	Thomas, I. C.	1877	White, G. G.
1884	Smith, J. H. M.	1882	Thompson, G. F.	1876	White, J. C.
1889	Smith, O. S.	1888	Thompson, H. M.	1886	Wickham, L. L.
1877	Smith, W.	1893	Thompson, M. A.	1892	Wickham, P. F.
1891	Smith, E. A.	1878	Thomson, A. S.	1884	Wildeblood, H. S.
1893	Smith, W. H.	1889	Thornton, C. du P.	1890	Wildeblood, J. P.
1875	Smithe, E. du Cane.	1875	Tickell, C.	1887	WILLIAMS, W. R., *F.C.H.*
1886	Smyth, T. W. S.	1878	Tickell, J. R.		
1884	Sprott, F. L.	1881	Tickell, R. H.	1893	Williamson, R. M.
1880	Squire, S. N.	1877	Tilly, H. L.	1891	WILLMOTT, H.M., *F.C.H.*
1886	Stanley, E. G.	1893	Tireman, H.		
1890	Standley, A. W.	1875	Todd, A. B.	1887	Wilson, C. D. D.
1893	Stanton, W. C.	1888	Tottenham, W. F. L.	1879	Wilson, F. J.
1893	STAPLETON, B., *F.C.H.*	1891	Trafford, F.	1885	Wilson, J. S.
1883	Starkey, W. B.	1887	Trapmann, A. G. R.	1874	WILSON, W. J., *F.C.H.*
1884	Stawell, G. C.	1878	Trevor, A. S.		
1876	St. Clair, Hon. L. M.	1891	Truninger, L.	1876	WOLLEY-DOD, F. *F.C.H.*
1893	Stebbing, E.	1879	TUCK, E. H., *F.C.H.*		
1878	Stephen, K. H.	1891	Tullock, J. C.	1882	Wood, C. W.
1892	Stirling, J. L.	1877	Ussher, C. J.	,,	Wood, W. G.
1881	Strachey, R. S.	1881	Verschoyle, J. K. E.	1893	Wood, H. F. A.
1879	Strange, W. L.	1874	Vincent, C.	1886	Woodside, J.
1891	Streatfeild, G. H.	1877	Wallace, J.	1878	Woodward, H. S.
1880	Strickland, H. J.	1882	Walling, H. O.	1880	Woollcombe, R.
1882	Styan, H. S.	1890	WALSH, A. R., *F.C.H.*	1890	Wright, F.
1893	Sullivan, W.	,,	Walsh, C. P.	1877	Wright, T. H.
1877	Summers, T.	1891	Walton, H. R.	1882	WYLIE, G., *F.C.H.*
1876	Sutherland, A. R.	1883	Ward, T. R. J.	1877	Yates, O. V.
1888	Sutherland, J.	1879	Wathen, H. A. D.	1878	Yates, R. B.
1891	Sutherland, W.	1874	Watson, C. J. K.	1886	Yeoman, F. W. K.
1880	Sweet, G. W.	1875	Watts, G. K.	1877	Young, B. H.
,,	Sweet, W. M.	1873	Way, R. A.	1882	Younghusband, A.
1884	SYKES, C. F., *F.C.H.*	1881	WEBB, A. L., *F.C.H.*	1890	Zorab, J.

SENIORITY LIST OF PASSED STUDENTS OF THE COLLEGE NOW SERVING IN THE PUBLIC WORKS TELEGRAPH AND FOREST DEPARTMENTS OF INDIA.*

Corrected to 31*st December* 1893.

The names in Capitals are of Fellows of Coopers Hill (F.C.H.).

NAME.	Province or Branch of the Service.	Division.	Station.	Grade.	REMARKS.
		1872.			
William Patrick Brodie	Punjab Irrigation	.....	.....	Exec. 1st	On furlough
		1873.			
Robert Greig Kennedy	Punjab Irrigation	Bari Doab Canal, 3rd Dn.	Amritsar	Exec. 1st	
Charles William Hodson	State Railways	North Western Railway	Quetta	Exec. 1st	
JOHN BENTON, F.C.H.	Punjab Irrigation	Multan Canals	Multan	Exec. 1st	
Charles Augustus Mills	Bengal	Bihar	Bankipore	Exec. 1st	
Robert Attwooll Way	State Railways	Chittagong-Akyab-Minhla Survey	Headquarters	Exec. 1st	
		1874.			
BENJAMIN PARKES, *B.E.*, F.C.H.	Punjab	Amritsar	Amritsar	Exec. 1st	
EDWARD WM. ARUNDELL, *B.A.*, F.C.H.	State Railways	Deputy Consulting Engr.	Bombay	Exec. 1st	
Edwyn Hermann Pargiter	Punjab Irrigation	.....	.....	Exec. 1st	On furlough

* Notice of Corrections to be sent to the College Secretary.

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
David Bayne Horn, F.C.H.	Bengal Irrigation	South-Western Circle	Calcutta	Exec. 1st	Inspector of Works
William John Wilson, F.C.H.	N.W.P. and Oudh Irrigation	.....	.....	Exec. 1st	Lent to Egyptian Govt.
Alfred Cornelius Newcombe, *B.A.*	Foreign Dept.	... ..	.....	Exec. 2nd	Supernumerary Nizam's Dominions
James Tait	State Railways	Mu Valley Railway	Ywatoung Sagaing	Exec. 1st	
Henry William Vaughan Colebrook.	Punjab Irrigation	2nd Chenab Canal	Gujranwalla	Exec. 1st	
Ernest Ifill Shadbolt	State Railways	Godavari Bridge	Koovwr	Exec. 1st	
Charles A. Perrin	N.W.P. and Oudh Irrigation	Sanitary Eng., N.W.P. & O.	Allahabad	Exec. 1st	
Henry Marsh	N.W.P. and Oudh Irrigation	Ganges Canal	Bulandshahr	Exec. 1st	
Alfred Joyce	Madras	Godaveri Western	Chettipett	Exec. 1st	
George Edward Coles	N.W.P. & Oudh Irrigation	Rohilkand Canals	Bareilly	Exec. 1st	
Arthur Trethowan Goodfellow	Accounts Branch	Bengal-Nagpur Railway	Nagpur	Exmr. 4th Cl. 1st Grade.	Supernumerary
J. J. Mullaly	Punjab Irrigation	1st Div., Bari Doab Canal	Amritsar	Exec. 1st	
Robert Alfred Molloy	Ditto	Dera Ghazi Khan	D. G. Khan	Exec. 1st	
Ebenezer Anderson Carswell	N.W.P. and Oudh Irrigation	Revenue Dept.	.....	Exec. 1st	Supernumerary
Edmund Penny	Central Provinces	Jubbulpore	Jubbulpore	Exec. 1st	
Stephen Finney	State Railways, Revenue Branch	Eastern Bengal S. Railway	Calcutta	Cl. I. Grade I.	Manager
Walter Bernard De Winton	Madras	.....	.....	Exec. 1st	On furlough
William Arbuthnot Inglis	Bengal Irrigation	.....	.....	Exec. 1st	On furlough
Charles James Knight Watson	Burmah	.....	.....	Exec. 2nd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
George Augustus Grant Shawe	Bengal Irrigation	Mahanuddy	Cuttack	Exec. 1st	
Claude Vincent	Govt. of India Secretariat	Under Secretary C.W.B.	Calcutta	Exec. 1st	
Alfred Howard Garrett	Madras	Madura Division	Madura	Exec. 1st	
Walter Griffith Allen	State Railways	Kalka Simla Rlwy. Survey	Kasauli	Exec. 2nd	
Walter Campbell De Morgan	Madras	.....	...	Exec. 1st	On furlough
John Paton Davidson	Madras	South Arcot	Cuddalore	Exec. 1st	
Arthur Cecil Crampton	Burma	.....	.....	Exec. 2nd	On furlough
Frederick Benbow Hebbert	Govt. of India Secretariat	Offg. Under Secretary to Government Railway B.	Calcutta	Cl. I., Gr. 3, Revenue	
		1875.			
Thomas Elmitt Curry	State Railways	Mushkaf Railway	Hirok	Exec. 2nd	
Lionel Montague Jacob	Punjab Irrigation	.....	...	Exec. 1st	On furlough
Herbert Septimus Harington	State Railways	North-Western Railway	Rawul Pindi	Exec. 2nd	
Theophilus Michell	Ditto	.....	...	Exec. 2nd	On furlough
Harry Victor Sampson Baker	Punjab	Under Secy. to Govt.	Lahore	Exec. 2nd	
Edward Skelton Bellasis	Punjab Irrigation	Multan Canals	Multan	Exec. 2nd	
George Moyle	State Railways	Lent to B.N. Railway	Dougargarh	Exec. 2nd	Supernumerary
Charles Howard Cotton Bickerton	Ditto	Off. Dep. Consulting Engr.	Bombay	Exec. 2nd	
Charles Edward Day	Punjab Irrigation	.....	...	Exec. 2nd	Special duty
John James Hatten	Punjab Irrigation	W. Jumna Canal	Hissar	Exec. 2nd	
Arthur Cotton Livingstone-Learmouth.	Punjab	.....	...	Exec. 2nd	Specially retired
Edmund DuCane Smithe	Punjab Irrigation	Swat River Canal	Mardan	Exec. 2nd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
James Samuel Brown	State Railways	North-Western Railway	Lahore	Exec. 2nd	
Chas. Cornwallis Burton Knapp	Central Provinces	Eastern	Raipur	Exec. 3rd	
Charles Tickell	Punjab Irrigation	Lent to Kashmere State	Srinagar	Exec. 2nd	
George Bernard Reynolds	State Railways	Warora Colliery	Warora	Exec. 2nd	
Samuel Rebsch	Bombay	Bombay	Bombay	Exec. 1st	
Frederick Sharp	Burma	Minbu Division	Minbu	Exec. 2nd	
Joseph William Parry	State Railways	Mushkaf-Bolan Railway	Mach	Assist. 1st	
Horace Chaloner Knox	Ditto	Bhavnagar Railway	Ghadechi	Exec. 2nd	Supernumerary
Charles Frederic Gilbert	Burma	Chindwin	Monywa	Exec. 3rd	
Augustus Bythesea Todd	Madras	Cuddapah	Cuddapah	Exec. 2nd	
George Augustus Anderson	State Railways	Lent to B.N. Ry.	Nagpur	Exec. 2nd	Supernumerary
Morice Leslie	Central Provinces	Coorg	Mercara	Exec. 1st	
Charles Mitford Smith	Madras	.....	...	Exec. 2nd	On furlough
John Henry Parsons Forsyth	N.W.P. and Oudh	.....	...	Exec. 1st	On furlough
George Kempthorne Watts	Assam	Manipur Road	Kohima	Exec. 1st	
Alexander Sherwood Russell	Madras	Buckingham Canal	Madras	Exec. 2nd	
John Herbert Handley	Hyderabad	West Berar	Buldana	Assist. 1st	
George Steel Travers Harris	Local Administrations	Lent to Gwalior State	Morar	Exec. 1st	Supernumerary
Josiah Edward Paul	Madras	Nellore	Nellore	Exec. 2nd	
George Proctor Carless	Madras	Periyar Division	Madura	Exec. 2nd	
Appointed as Assistant Engineer, Third Grade.					
Chas. Henry Beaumont Burlton	Madras	.....	Mount	Exec. 2nd	On furlough

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		1876.			
Francis Wolley-Dod, F.C.H.	State Railways	Deputy Consulting Engr.	.....	Exec. 2nd	
Reuben William Roberts, F.C.H.	Ditto	.....	.....	Exec. 3rd	On leave
William Henry Cole	Ditto	Eastern Bengal System	Calcutta	Exec. 2nd	Offg. Depty. Manager
Lionel Barrington Simeon	N.W.P. and Oudh.	Lucknow	Lucknow	Exec. 2nd	
William Michell	North-Western Railway	Rawul Pindi	Rawul Pindi	Exec. 2nd	
Henry James Oddie	Ditto	.....	.....	Exec. 2nd	On furlough
Henry Edmunds Haddon, *B.A.*	Ditto	Lent to B.B. & C.I. Ry. Co.	.....	Exec. 2nd	On leave
George Owen William Dunn	Bombay	Ahmednagar	Ahmednagar	Exec. 2nd	
Jno. Monthemer Montague, *B.A*	State Railways	Tirhoot Railway	Muzufferpore	Exec. 2nd	Supernumerary
Edward Fountaine Jacob	State Railways, Revenue Branch	North-Western Railway	Lahore	Cl. I. Grd. 2	
Edward Pinhey	Bombay	.....	.....	Exec. 2nd	On leave
Edward Baker	State Railways	Mari-Attock Railway	Campbellpore	Exec. 2nd	
Robert Philip Atkinson	N.W.P. & Oudh Irrigation	Lower Ganges Canal	Etawah	Exec. 2nd	
Francklyn Lang	State Railways	Lent to B.N. Ry.	.....	Exec. 2nd	Supernumerary. On
Charles John Seymour Baker	Ditto	Lucknow-Bareli Railway	.....	Exec. 2nd	On leave. [leave.
John Claude White	Bengal	Sikkim	Gantok	Exec. 2nd	On political duty in
Hon. Lockhart Matthew St. Clair	Central Provinces	.....	.....	Exec. 2nd	On furlough [Sikkim
Edward Henry Johns	Accounts Branch	Burma State Railway	Rangoon	Exm. 4th Cl. 2nd Grd.	
William Cuthbert Lewis	Madras	Coimbatore	Coimbatore	Exec. 2nd	
John Edwin Dallas	State Railways	Offg. Dy. Con. Engr.	Bombay	Exec. 2nd	
Edward Henry Clementson	Ditto	Lent to Rangoon Port Trust	Rangoon	Exec. 2nd	Supernumerary
Robert Sivewright	Ditto	Delhi Minchabau Ry.	Umbala	Exec. 3rd	
Alexander Bewley	Ditto	East Coast Railway	Kharda Road	Assist. 1st	

NAME.	Province or Branch of the Service.	Division.	Station.	Grade.	REMARKS.
Reginald Samuel John Routh	State Railways	Lent to A.B. Ry. Co.	.....	Exec. 2nd	Supernumerary
William Spencer Haig	Ditto	Saugor-Katni Ry. Survey	.....	Exec. 2nd	
Algernon Robert Sutherland	N. W. P. and Oudh	Rohilkhund	Bareilly	Exec. 2nd	
Montgomery Penrose Coode	Burma	Rangoon	Rangoon	Exec. 2nd	
Charles Henry Holme	N. W. P. and Oudh	Kumaon	Naini Tal	Exec. 2nd	
Charles Napier Clifton	Bombay	Ghar Canals	Larkhana	Exec. 2nd	
William Gyllich Newton	Burma	.....	.....	Exec. 2nd	On furlough
William Henry Le Quesne	Bombay	Poona	Poona	Exec. 2nd	
Mackay John Scobie	Burma	Thayetmyo Division	Thayetmyo	Exec. 2nd	
Alfred George Harrison	Accounts Branch	R. & C. India	Abu	Exm. 4thCl. 2nd Grd.	

1877.

HENRY GEORGE BOYCE, F.C.H.	N.W.P. & Oudh Irrigation	Municipal Dpt. N.W.P.&O.	.....	Exec. 2nd	Supernumerary
Robert Abraham English	Accounts Branch	Lent to B.B. & C.I. Ry. Co.	Bombay	Exm. 4thCl. 2nd Grd.	Supernumerary
FREDERICK REILLY, F.C.H.	State Railways	North-Western Railway	Saharanpur	Exec. 2nd	
Stanley De Brath	Ditto	Asst. Secy. Govt. of India	Calcutta	Exec. 2nd	
H. Henry Fox	Burma	Rangoon	Rangoon	Exec. 2nd	
Henry Leith Hebbert	Punjab Irrigation	Chenab Canal	Khanki	Exec. 2nd	
Clement Hill	N.W.P. & Oudh Irrigation	Narora	Narora	Exec. 2nd	
William Edward Newham	Railway Branch	Mu Valley Railway	Ywatoung Sagaing	Exec. 2nd	
Walter Smith	Punjab	.....	.....	Exec. 2nd	On furlough
Octavius James Shedlock	State Railways, Burma	Mu Valley Railway	Ywatoung Sagaing	Exec. 2nd	
Francis Robert Tebbs	State Railways	Rajputana-Malwa Railway	Fatehgarh	Exec. 2nd	Supernumerary
Thomas Summers	Bombay	Fuleli Canals	Hyderabad	Exec. 2nd	
James Wallace	Railways	Chittagong-Akyab-Minhla Railway Survey	.....	Exec. 2nd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
George Pringle Rose, C.I.E.	State Railways	.....	.....	Exec. 2nd	
John Henry Anderson Ivens	N.W.P. and Oudh Irrig.	Eastern Jumna Canal	Dehra Dun	Exec. 2nd	On furlough
Duncan George	Bombay	Bijapur	Bijapur	Exec. 2nd	
George Gilbert White	Central Provinces	Attached to Sect.	Nagpur	Exec. 2nd	
George Abreo Savielle	State Railways	Rajaputana Railway	.....	Exec. 2nd	Supery. Special work.
George Streatfeild Morley	Punjab Irrigation	Mozuffergarh	Mozuffergarh	Exec. 2nd	
St. John Hewitt	State Railways	Headquarters	Rangoon	Assist. 1st	
John Bonfoy Leventhorpe	Central Provinces	Jubbulpore	Jubbulpore	Exec. 2nd	
Francis William Chanter	Punjab Irrigation	Chenab Circle	Lahore	Exec. 2nd	
Charles Octavius Leefe	Central Provinces	Kanhan	Kampti	Exec. 2nd	
Arthur Edward Hight	Bombay	Kaira and Panch Mahals	Kaira	Exec. 2nd	
Oswald Vavasour Yates	Punjab Irrigation	Hissar	Hissar	Exec. 2nd	
Robert Thomas Denne	State Railways	Offg. Dep. Consulting Eng.	Calcutta	Exec. 2nd	
Walter Home	Ditto	Jodhpur Branch Railway	Jodhpur Jnctn.	Exec. 2nd	Supernumerary
Thomas Herbert Wright	Accounts	Railway Branch	Gorakhpore	Ex. 4 Cl.3 Gd.	
William Lochiel Sapte Lovett Cameron	Bombay	Dharwar	Dharwar	Exec. 2nd	
Frederick Augustus Dashwood	Ditto	Ratnagiri and Kolaba	Ratnagiri	Exec. 3rd	
Joseph Edward Gabbett	State Railways	Lent to B. B. & C.I.Ry.Co.	Bikanir	Exec. 2nd	Supernumerary
Herbert Spry Talbot	Ditto	.....	.....	Exec. 4th	Specially retired
Christopher James Ussher	Madras	Godavari	Dowlaishweram	Exec. 2nd	
Edward Meares Sage	Burma	.....	.....	Exec. 4th	Resigned
George Edward Manson	Madras	Salem Division	Salem	Exec. 2nd	
Allan Arthur Grenville Malet	Ditto	Kistna Western	Duggirala	Exec. 2nd	
William Jopp	Ditto	.....	.....	Exec. 2nd	On furlough
George Buchanan Lambert	Ditto	Tanjore	Tanjore	Exec. 2nd	
Barclay Hughes Young	Ditto	Godaveri Western Division	Chettipet	Exec. 3rd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		1878.			
Richard John Woods, F.C.H.	State Railways	.....	.....	Exec. 2nd	Specially retired
William Chadwick, F.C.H.	State Railways, Burma	Mu Valley Railway	Katha	Exec. 2nd	Sub. *pro tem.* rank
Lancelot George Prickett, F.C.H.	Ditto	Asst. Sec. Govt. India	Simla	Exec. 3rd	
James Alfred Cones	N.W.P. & Oudh Irrigation	Manipuri Div., L. Ganges Canal	Bhongaon	Exec. 3rd	
Norman Frederick McLeod	N.W.P. & Oudh Irrigation	Northern Divn., Ganges Canal	Roorkee	Exec. 2nd	
Joseph Richard Clinton Nicolls	N.W.P. & Oudh Irrigation	Per. Assist. to Chief Engr.	Allahabad	Exec. 2nd	
Henry Parsall Burt	State Railways	Asst. Sec. Govt. India	Calcutta	Exec. 3rd	
Kent Hume Stephen	Bengal Irrigation	Under Secy. Govt. Ben.	Calcutta	Exec. 2nd	
Nicol Finlayson Mackenzie	N.W.P. & Oudh Irrigation	Ganges Canal	Meerut	Exec. 2nd	
James Trembath Boase	Punjab Irrigation	Western Jumna Canal	Hissar	Exec. 2nd	
Frank Dashwood Fowler	State Railways	Offg. Dy. Con. Enginr.	Nagpur	Exec. 3rd	
Ernest Gordon Fraser	Punjab Irrigation	.....	.....	Exec. 2nd	On furlough
Arthur Henry Mason	State Railways	East Coast Railway	Chatrapur	Assist. 1st	
Ernest Frederick Dawson	Bombay	Karachi Canals	Karachi	Exec. 2nd	
Amyas Morse	State Railways	North-Western Railway	Lahore	Exec. 3rd	
John Hall Brooke	Punjab Irrigation	Bari Doab Canal	Amritsar	Exec. 3rd	
Francis John Pope	State Railways	Offg. Dep. Con. Engr.	Calcutta	Exec. 3rd	On furlough
Charles Henry Barratt	Punjab	Peshawar	Peshawar	Exec. 2nd	
Thomas Walter De Winton	Bombay	Eastern Nara Canals.	Hyderabad	Exec. 3rd	
Robert Walter Egerton	State Railways	North-Western Railway	Shelabagh	Exec. 3rd	
Arthur Sydney Macdonald Ritchie.	Bombay	Begari Canals	Jacobabad	Exec. 3rd	

NAME.	Province or Branch of the Service	Division.	Station.	Grade.	REMARKS.
Arthur Sackville Thomson	Bengal Irrigation	Eastern Sone	Bankipur	Exec. 2nd	
Richard Robert Menneer	Bombay	Western Nara Canals	Dadu (Sind)	Exec. 3rd	
Alfred Septimus Trevor	State Railways	Rajputana-Malwa Railway	Bandikui	Exec. 3rd	Supernumerary
Frank Rawson	Accounts	.....	.....	Exm.4thCl.2ndGrd.	On furlough
Oswald Campbell Lees	Bengal Irrigation	Gunduck	Mozufferpore	Exec. 2nd	
Hugh Hamlyn O'Connell	Madras	.....	.....	Exec. 2nd	On furlough
James Robert Tickell	State Railways	Rajputana-Malwa Railway	Ajmere	Exec. 3rd	Supernumerary

Appointed as Assistant Engineers, Third Grade.

Henry William Bennett	State Railways	Offg. Dep. Cong. Engr.	Madras	Exec. 3rd	.....
Robert Benton Yates	Punjab	Rawul Pindi	Murree	Exec. 3rd	On furlough
William John Alexander Bird	Punjab Irrigation	.....	.....	Assist. 1st	On furlough

Appointed as Assistant Superintendents, Telegraph Department.

TrevorDouglasDaviesBerrington	.....	.....	.....	Supt. Cl. V. 2nd Grade	Director-Gen.'s Office
Francis Erskine Dempster	Burma	Burma	Rangoon	Supt. Cl. V. 2nd Grade	
Arthr.LawrenceHamiltonPalmer	Madras	Madras	Madras	Supt. Cl. V. 2nd Grade	
Henry Selwyn Woodward	Madras	Madras Office	Madras	Supt. Cl. V. 2nd Grade	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
Appointed as Assistant Superintendents, Telegraph Department, with Rank from 26th January 1879.					
John William Hensley	Bengal	Electrician	Calcutta	Supt. Cl. V. 2nd Grade	
Hugh Theodore Pinhey	.....	.....	.....	Supt. Cl. VI. 1st Grade	On furlough
Charles Streatfeild James	.....	.....	.....	Asst. Supt., Cl. VI. 1st Grade	On furlough
Non-collegiate Student, appointed as Assistant Engineer, Second Grade.					
Frank Harris, *B.A.*	Punjab Irrigation	Chenab Canal	Jhuny	Exec. 2nd	
1879.					
Arthur Hill, F.C.H.	Bombay	Thana	Thana	Exec. 3rd	
Edmund Henry Tuck, F.C.H.	State Railways	Offg. Dep. Cong. Engr.	Lucknow	Exec. 3rd	
William Lumisden Strange	Bombay	Dharwar	Dharwar	Exec. 3rd	
Henry George Scott Savory	State Railways	M. B. S. Railway	.....	Exec. 3rd	
Francis Gyde Heaven	Accounts Branch	E. India Railway	Calcutta	Ex. 4th Cl. 3rd Grd.	
Arthur Maurice Fagan	Burma	.....	.....	Exec. 3rd	
FrancisSt.GeorgeMannersSmith	Rajputana & Central India	Lent to Kotah and Jallawar States	Ulwar	Exec. 2nd	Supernumerary
Angus Roderick Macdonald	State Railways	Lent to Jeypore State	Ulwar	Exec. 3rd	
Lennox Robertson Fraser	Bengal	Sone Circle, Arrah Div.	Arrah	Exec. 3rd	
Henry Francis Burnes Frost	Punjab Irrigation	Shahpur Canals	Shahpur	Exec. 3rd	
Frederick Wm. Mortimer Scott	Central India	Indore Division	Indore	Exec. 2nd	
Charles John Cole	State Railways	Mushkaf Railway	Panir	Exec. 3rd	
Alfred Mason Hayes	Madras	Ganjam	Berhampore	Exec. 3rd	
David William Herbert	Bombay	Begari Canals	Jacobabad	Exec. 3rd	
Frederick James Wilson	Madras	Chingleput	Mount	Exec. 3rd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
Hubert Kench	Assam	Assist. Sec. to Chief Comr.	Shillong	Exec. 2nd	
Alfred Montague Foord	Madras	.....	.....	Exec. 3rd	On furlough
Henry Arthur Douglas Wathen	Accounts Branch	Assist. Acct. Genl.	.....	Exam. 4th Cl. 3rd Grade	Officiating
Theobald Butler	Bengal Irrigation	.....	.....	Exec. 2nd	On furlough
Algernon Leventhorpe	Burma	.....	.....	Exec. 2nd	On furlough
Webster Boyle Gordon	N.W.P. & Oudh Irrigation	Per. Assist. to Chief Engr. and Under Sec. Irrig. Brch.	Allahabad	Exec. 2nd	
James Percy Henderson	North-Western Railway	Collieries	Dandot	Exec. 3rd	Special Engineer
Appointed as Assistant Engineers, Third Grade.					
James Francis Herbert Collet	State Railways	.....	.....	Assist. 1st	On furlough
Robert Dacres Menzies Lang	N. W. P. and Oudh	Agra	Muttra	Assist. 1st	
Horace Hassell Roden	Central Provinces	Kanhan	Kampti	Exec. 3rd	
Appointed as Assistant Superintendents, Telegraph Department.					
Hen. Montague Segundo Mathews	.....	.....	.....	Asst. Sup., Cl. VI., 2nd Grade	Seconded
Reginald Oswald Lees	Burma	Arakan	Akyab	Sup., Cl. V., 2nd Grade	
Henry Whitby Smith	Bengal	Calcutta Office	Calcutta	Asst. Sup., Cl. V., 2nd Grade	
Percy Melville Madge	Sind and Beluchistan	Sind and Beluchistan	Karachi	Supt. Cl. V., 2nd Grade	
Rayner Childe Barker, C.I.E.	.....	.....	...	Asst. Sup. Cl. VI., 1st Grade	On furlough

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		1880.			
Robert Charles Dyson, F.C.H.	State Railways	Depy. Consulting Engr.	Bombay	Exec. 3rd	
Edwin John Alexander, F.C.H.	Ditto	Lent to Assam Behar Ry. Co.	... ..	Exec. 3rd	Supernumerary
John Manson	Ditto	Lent to Bengal Dooars Ry.	.....	Exec. 3rd	Supernumerary
Michael Nethersole	N.W.P. & Oudh Irrigation	Lent to Kashmir State [Co.	.....	Exec. 3rd	Supernumerary
Reginald Woolcombe	State Railways (locomotive)	Rajputana-Malwa Railway	Mhow	Cl. II. Grd. 3	Supernumerary
William Elmitt Curry	Accounts Branch	Indian Midland Railways	Jhansi	Exm. 4th Cl. 3rd Grd.	
Samuel Nathaniel Squire	Bombay	Dharwar	Dharwar	Exec. 3rd	Temporary rank
William Robert Shaw	State Railways	North-Western Railway	Ling	Exec. 3rd	
William Arthur Johns	Ditto	Mushkaf Bolan Railway	Sibi	Exec. 3rd	
Eric Arthur Lee	Accounts Branch	.....	.....	Exm. 4th Cl. 3rd Grd.	On furlough
Henry Seymour Guinness	State Railways	Mu Valley Railway	Wuntho	Exec. 3rd	
Richard Douglas Perceval	Ditto	.....	.....	Exec. 3rd	On furlough
George William Sweet	Accounts	Bombay Railways	.....	Exm. 4th Cl. 3rd Grd	
Harry John Strickland	N.W.P. & Oudh Irrigation	.....	.....	Exec. 3rd	On leave
Arthur James Scratchley	Punjab Irrigation	Western Jumna Canal	Karnal	Exec. 3rd	
Henry Joseph Johnston	Punjab Irrigation	Bari Doab Canal	Jandiala	Exec. 3rd	Temporary rank
Roderick Edmond Carter	Bengal Irrigation	Brahmini Bytumi	Cuttack	Exec. 3rd	
Alexander Grant	Punjab	Simla	Simla	Assist. 1st	
Herbert John Landon	Bombay	Thana	Thana	Exec. 3rd	Temporary rank
Granville Mills	State Railways	Eastern Bengal S. Ry.	Khatihar	Assist. 1st	
George Campbell Maconchy	Bengal Irrigation	Under Secy. to Govt.	Calcutta	Exec. 3rd	
Ernest Trevelyan Faulkner	State Railways	Chittagong A. M. Ry.	.....	Exec. 3rd	Sub. *pro tem.* rank
Cecil Archibald Smith	Madras Irrigation	Kistna Eastern	Bezváda	Exec. 3rd	
James Norman Dignes La Touche	State Railways	Eastern Bengal S. Ry.	Saidpur	Exec. 3rd	Temporary rank

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
William McMurdo Sweet	Assam	.....	.....	Exec. 3rd	On furlough
Herbert Richard Francis Ash	Hyderabad	East Berar	Amraoli	Exec. 3rd	
Herbert J. Anstruther Bowden	Punjab	Jullunder	Jullunder	Assist. 1st	
Hugh Edward Clerk	Madras	North Arcot	Vellore	Exec. 3rd	
Philip John Fitzgibbon	Bombay	Poona	Poona	Assist. 1st	
Stuart Durand Pears	Madras	No. I. Periyar	Periyar	Exec. 3rd	Temporary rank
	Appointed as Assistant Engineer, Third Grade.				
James Donnan	C. Provinces	.....	.....	Assist 1st	
	Appointed as Assistant Superintendents, Telegraph Department.				
Arthur Willoughby Foord	Bengal	Allahabad Sub-division.	Allahabad	Asst. Sup., Cl. VI., 1st Grade	
Eustace Alban Kenyon	Bengal	Director-General's Office	Calcutta	Asst. Sup., Cl. VI.,2ndGrade	
Hugh Stewart Olphert	Punjab	Kashmir	Srinagar	Asst. Sup., Cl. VI.,2ndGrade	
Arthur Phillip Hill	Oudh and Rohilkhund	Lucknow Sub-division	Lucknow	Asst. Sup., Cl. VI.,2ndGrade	
		1881.			
George Deuchars, F.C.H.	State Railways	Burma State Railway	Rangoon	Exec. 3rd	Temporary rank
Arthur Lewis Webb, F.C.H.	N.W.P. Irrigation	Special duty in Office of Chief Engineer	Allahabad	Exec. 3rd	
Charles Arthur White	Bengal Irrigation	.....	.....	Exec. 3rd	On furlough
John Charles Mills	State Railways	Behar	Katihar	Assist. 1st	
Walter James Weightman	Ditto	Nilgiri Railway	Coonoor	Assist. 1st	Supernumerary

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
Charles Herbert Hutton	N.W.P. Irrigation	Agra Canal	Agra	Exec. 3rd	
James Bernard Chirnside	State Railways	East Coast Railway	Waltair	Exec. 3rd	Temporary rank
George Harry Le Maistre	Military Works Branch	.....	.....	Ex. Cl. 4 Gr. 3	
Edward Rawson Gardiner	Bengal	Darjeeling	Darjeeling	Exec. 3rd	Temporary rank
Lionel Arnold Light	Assam	Manipur Road	Kohima	Exec. 3rd	Temp. in Assam, Temporary rank
Richard Sholto Strachey	Burma	Lent to Assam Bengal Ry. Co.	.....	Assist. 1st	Supernumerary
James Kynaston Edwards Verschoyle	Punjab Irrigation	Chenab Canal	Guzranwala	Exec. 3rd	Temporary rank
Chas. Hen. Dillon Marjoribanks	Madras	Nellore Division	Buchireddipalem	Exec. 3rd	Temporary rank
Walter Giles	State Railways	North-Western Railway	.....	Assist. 1st	On furlough
Benjamin Kington Finnimore	Bengal	Chota Nagpur	Ranchi	Assist. 1st	
Cuthbert James O'Brien	Punjab Irrigation	Patiala State	Patiala	Assist. 1st	On special duty
Charles Skrymsher Rennick	State Railways	North-Western Railway	Amritsar	Exec. 3rd	Temporary rank
Mountstuart Hungerford Jackson	Bengal Provincial	Calcutta	Calcutta	Assist. 1st	
Donald Mackay Scobie	Hyderabad Provincial	East Berar	Ellichpore	Assist. 1st	
Marmaduke Henry Arnott	Bengal Irrigation	Aquapada-Jajepore	Aquapada	Assist. 1st	
Harry Vivian Majendie Phelips	Bombay	Ahmednagar	Ahmednagar	Assist. 1st	
Richard Hugh Tickell	Punjab Irrigation	Mooltan Canals	Mooltan	Exec. 3rd	Temporary rank
John Joseph Whiteley	Mysore	Tempy. Foreign Dept.	.....	Assist. 1st	
Henry Vero Rooke Kemball	Bombay	Ghar Canals	Larkhana	Assist. 1st	
John Henry Medlicott	Madras	Bellary	Bellary	Assist. 1st	
Wm. Erskine Fraser Handcock	Punjab Irrigation	Sirhind Canal	Ludhiana	Exec. 3rd	Temporary rank
Frederick William Maunsell	Ditto	Sirhind Canal	Dhapai	Exec. 3rd	Temporary rank
Percy Earle Raven	Burma	S.E. Office, 2nd Circle	Thayetmyo	Exec. 3rd	Temporary rank
Spencer Cox	Ditto	Second Circle	Thayetmyo	Assist. 2nd	On furlough
William Drew	State Railways	North-Western Railway	Lahore	Assist. 1st	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		Appointed as Assistant Engineers, Third Grade.			
Archibald Thomas Mackenzie	Madras	Periyar Project	Periyar	Exec. 3rd	Temporary rank
George Fraser Handcock	Ditto	Vizagapatam	Waltair	Exec. 3rd	Temporary rank
		Appointed as Assistant Superintendent, Telegraph Department.			
Ivor Cradock Thomas	.....	.....	.....	Asst. Supt., Cl. VI., 2nd Grade	On furlough
		1882.			
George Wylie, F.C.H.	N.W. Provinces	Northn. Div., Ganges Canal	Myapur	Assist. 1st	
Robert Douglass	Punjab Irrigation	Bari Doab Canal	Lahore	Exec. 3rd	Temporary rank
Harold B. Taylor, F.C.H.	State Railways	Lent to Gwalior State	Sehore	Assist. 1st	Supernumerary
Charles Cosley S. Clark	Burma	Meiktilla	Meiktilla	Exec. 3rd	
Walter Duncan Barrow	State Railways	.....	.....	Assist. 1st	On furlough
Henry Fitzgerald Beale	Bombay Irrigation	Nira Canal	Poona	Assist. 1st	
Henry Charles Sanders	Punjab	Dera Ishmail Khan	Bannu	Assist. 1st	
Albert Edward Silk	Bengal Irrigation	.....	.....	Assist. 1st	On furlough
Reginald Pemberton Russell	Punjab Irrigation	Chenab Canal, 2nd Div.	Salar	Assist. 1st	
Ratcliffe William Rowland	Ditto	Sirhind Canal	Rupar	Assist. 1st	
William Hayward Rushton	N.W.P. Irrigation	Anupshahr	Meerut	Assist. 1st	
Harold Barlow	Bengal Irrigation	.....	.....	Assist. 1st	On furlough
John Frederick Somers-Eve	Madras	Rushi Kulya	Dogam	Exec. 3rd	Temporary rank
Walter Gunnell Wood	N.W. Provinces	Fyzabad	Fyzabad	Assist. 1st	
Herbert Phillips	State Railways	.....	.....	Assist. 1st	On furlough
Francis William Ashpitel	Madras	Under Secy. to Govt.	Madras	Exec. 3rd	Temporary rank

NAME.	Province or Branch of the Service.	Division.	Station.	Grade.	REMARKS.
John Inglis	Madras	Vizagapatam	Ellamanchilli	Exec. 3rd	
Ali Akbar	Bombay	.....	.....	Assist. 1st	On furlough
George Frederick Thompson	State Railways	Eastern Bengal Railway	Saidpur	Exec. 3rd	Temporary rank
Henry O. Walling	Burma	Bhamo Division	Bhamo	Exec. 3rd	Sub. *pro tem.* rank
		Appointed as Assistant Engineers, Third Grade.			
Charles William Wood	Madras	Madura	Madura	Exec. 3rd	Temporary rank
Parker Roscoe Allen	Madras	No. I. Periyar	Theckadi	Exec. 3rd	Temporary rank
George McCulloch Harrison	Bombay	Karachi Canals	Karachi	Assist. 1st	
Alfred Younghusband	Punjab	.....	Sukkur	Assist. 1st	On furlough
		Assistant Superintendents, Telegraph Department.			
H. S. Styan	Bombay	Poona	Poona	Asst. Sup., Cl. VI., 2nd Grade	
R. Elrington	Dir.-General's Office	.....	.....	Asst. Sup., Cl. VI., 2nd Grade	
		1883.			
HENRY M. JOHN BACON, F.C.H.	Burma	Central Irrigation	Shwebo	Exec. 3rd	
Thomas Robert John Ward	Punjab Irrigation	Chenab Canal	Marh	Assist. 1st	
A. E. Orr	Punjab	.....	.....	Assist. 2nd	On furlough
Henry E. Pellereau	Punjab Irrigation	.....	.....	Assist. 2nd	On furlough

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
James A. Devenish	N.W. Provinces	.....	.....	Assist. 1st	On furlough
Walter Baynton Starkey	Central Provinces	.....	.....	Assist. 2nd	On furlough
Thomas Herbert Clowes	Bengal Irrigation	Cossye Division	Midnapore	Assist. 1st	
Henry Hennis Green	Bengal	Gunduck	Mozufferpore	Assist. 1st	
Henry Sidney Jones	State Railways	Rajputana-Malwa Railway	.....	Assist. 1st	On furlough. Supy.
Henry McMillan	State Railways	Rajputana-Malwa Railway	Sirsa	Assist. 1st	Supernumerary
Alfred Rowland	State Railways	N.W. Railway, Sharigh	Harnai	Exec. 3rd	Temporary rank
Hon. Edward Herbert S. Napier	State Railways	.....	.....	Assist. 1st	On furlough
John N. A. Eaton	State Railways	.....	.....	Assist. 1st	On furlough
	Assistant Superintendent, Telegraph Department.				
Herbert Eldon Chappel	Bombay	Bombay	Bombay	Asst. Sup., Cl. VI., 2nd Grade	
		1884.			
Charles Frederick Sykes, F.C.H.	State Railways	North-Western Railway	Jhelum	Assist. 1st	
Jean Marie Antony Despeissis	State Railways	Mu Valley Railway	Wuntho	Exec. 3rd	Temporary rank
Henry Seddon Wildeblood	N.W. Provinces	Kumaon	Almora	Assist. 1st	
Arthur Carne Polwhele	N. W. P. Irrigation	.....	.....	Assist. 1st	On furlough
John Herbert Monk Smith	State Railways	Eastern Bengal System	Calcutta	Assist. 1st	
Lionel Fraser Robertson	Punjab	Jullundur Division	Kangra	Assist. 2nd	
James Sandiford Lane Long	Bengal Irrigation	Brahminy Byturnee	Cuttack	Assist. 1st	
Henry Celestine Robert John	Bombay	Nara Supply Channel Wks.	Karachi	Assist. 1st	
Frederick Lawrence Sprott	Bombay	Nasik	Nasik	Assist. 1st	[Supy.
George Cooper Stawell	Bengal	.....	.....	Assist. 2nd	Lent to San. Bd. Bengal
Stewart Bluney Murray	Madras	.....	.....	Assist. 1st	On furlough

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		Assistant Superintendents, Telegraph Department.			
Oldbury Burn	Bengal	Dacca	Barrackpore	Asst. Sup., Cl. VI., 2nd Grade	
Frank Mercer	.....	.....	.....	Asst. Sup., Cl. VI., 2nd Grade	On furlough
		1885.			
James Adam, F.C.H.	State Railways	North-Western Railway	.. ...	Assist. 1st	On furlough
CharlesThorntonRennieScovell	Railways	Offg. Dept. Cons. Engr.	Madras	Exec. 3rd	Temporary rank
William Nathan	Railways	North-Western Railway	Bhukkur	Exec. 3rd	Temporary rank
Henry Allan Moss	Madras	.....	.....	Assist. 2nd	On furlough
Frederick William Carne	Punjab Irrigation	Lent to Patiala State	.....	Assist. 2nd	Supernumerary
David Wann Aikman	N.W. Provinces	.....	.....	Assist. 1st	Lent to Muni. Dept.
Percy William Gilliland	Burma	Arrakan	Akyab	Exec. 3rd	Temporary rank
John Cromie Lyle	Railways	East Coast Railway	Gopalpooram	Exec. 3rd	Temporary rank
John Strode Wilson	Madras	Godaveri Eastern	Dowlaishweram	Assist. 2nd	
Robert Barnes	Bombay	.....	.....	Assist. 2nd	Services lent to Sukkur Municipality
George Charles Beresford	Bombay	.....	.....	Assist. 2nd	Ceased to belong to Engr. Estab.
Alfred Cecil Pereira	Madras	North Arcot	Ranipet	Assist. 2nd	
Graves Lempriere Searight	Bengal Irrigation	Buxar	Sikroul	Assist. 2nd	
Arthur William Shepard	Bombay	Western Nara Canals	Dadu	Assist. 2nd	
John Charles Hewitt	Bengal Irrigation	Buxar, Eastern Sone	Jamrore	Assist. 2nd	

NAME.	Province or Branch of the Service.	Division.	Station.	Grade.	REMARKS.
		Assistant Superintendents, Telegraph Department.			
John Melvill Coode	Bengal	Calcutta	Calcutta	Asst. Supt., Cl. VI., 2nd Grade	
Arthur John Lund Grimes	Bombay	Bombay Island	Bombay	Asst. Supt. Cl. VI., 2nd Grade	
		1886.			
ROBERT RICHARD GALES, F.C.H.	Railways	North-Western Railway	Jhelum	Exec. 3rd	Temporary rank
John Woodside	Railways	Mushkaf Railway	Panir	Exec. 3rd	Temporary rank
Frederick William Knaggs Yeoman	Punjab	Delhi	Delhi	Assist. 2nd	
Frederick Campbell Rose	Punjab Irrigation	Swat River Canal	Narrai	Assist. 2nd	
George Thomas Barlow	N.W. Prov. and Oudh	Narora	Pehra	Assist. 1st	
Francis Dundas Couchman	Railways	North-Western Railway	Gulistan	Exec. 3rd	Temporary rank
Francis Reilly	State Railways	Karachi	Karachi	Assist. 2nd	
Edward Gower Stanley	Burma	Third Circle	Mandalay	Assist. 1st	
Henry Lowthian Cleaver	Railways	Umaria Colliery	Umaria	Assist. 2nd	
Paul George Jacobs	Bengal Irrigation	Balasore	Contai	Assist. 2nd	
Leonard Latham Wickham	Madras	Presidency Workshop	Madras	Assist. 2nd	
Thomas William Score Smythe	Madras	Kistna Western	Duggirala	Assist. 2nd	
Matthew Loam	Madras	Ganjam	Balliguda	Assist. 2nd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		Assistant Superintendents, Telegraph Department.			
Goodall, H. C. A.	Madras	Madras	Madras	Asst. Supt., Cl. VI., 2nd Grade	
Gibbs, R. I.	Madras	East Coast	Vizagapatam	Asst. Supt., Cl. VI., 2nd Grade	
		1887.			
Harry Augustus Fred Currie, F.C.H.	State Railways	Sind-Sagar	Bhukkar	Assist. 1st	
William Richard Williams, F.C.H.	N.W. Provinces	.....	.....	Assist. 2nd	On furlough
Alfred Bonner Gale	N.W. Provinces	Gorakpur	Gorakpur	Assist. 2nd	
Harry James Eldridge	Punjab	Sirhind Canal	Teona	Assist. 2nd	
Charles Dundas Dove Wilson	State Railways	North-Western Railway	Quetta	Assist. 2nd	
Francis Villiers Tayler	Ditto	East Coast Railway	Calcutta	Assist. 2nd	
Augustus Hy. Chas. MacCarthy	Bengal Irrigation	Cossye	Panchkurah	Assist. 2nd	
Ernest Oscar Mawson	Bombay	Sholapur	Sholapur	Assist. 2nd	
Arthur Gordon Rose Trapmann	Burma	Toungoo	Toungoo	Assist. 1st	
Bernard Heaton	Bengal	Educational Department	.....	Assist. 2nd	Supernumerary
Harry Cecil Jones	Burma	Katha	Wuntho	Assist. 2nd	On leave
Hugh Trowbridge Keeling	Madras	Periyar Project	Periyar	Assist. 2nd	
Charles Mildred	Madras	Nellore	Nellore	Assist. 2nd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		Assistant Superintendents, Telegraph Department.			
Maurice Geo. Simpson	Madras	Madras	Madras	Asst. Supt., Cl. VI., 2nd Grade	
Gilbert Mahon	.....	.....	.....	Asst. Supt., Cl. VII., 1st Grd.	On six months' special leave
		Assistant Conservators, Forest Department.			
Chas. Gilbert Rogers, F.C.H.	Bengal	Forest School	Derha Dun	Dy. Con. 4th	Instructor, Seconded
George Sankey Hart	Punjab	Simla Hill Tracts	Simla	As. Cons. 1st	
Montague Hill	N.W. Provinces and Oudh	Kheri	Lakhimpur	As. Cons. 1st	
Edward Graves Oliver	Bombay	Sholapur	Sholapur	Dy. Con. 4th	
		1888.			
Frank Clayton, F.C.H.	N.W.P. and Oudh Irrig.	Agra Canal	Muttra	Assist. 2nd	
Ernest Albert Seymour Bell, F.C.H.	State Railways	East Coast Railway	.....	Assist. 2nd	On special duty. On leave
Charles Edward Dupuis, F.C.H.	N.W.P. and Oudh Irrig.	Ganges Canal, Etawah	Achalda	Assist. 2nd	
William Henry Ker Howard	State Railways	East Coast Railway	Tuni	Assist. 2nd	
Frederick Nutter Cox	Punjab Irrigation	.....	.....	Assist. 1st	Retired
Charles Vereker Lloyd	State Railways	Mu Valley Railway	Katha	Assist. 2nd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
Edward Gabbett	Burma	Mandalay Division	Mandalay	Assist. 1st	
James Sutherland	Burma	Northern Irrigation	Mandalay	Assist. 1st	Sub. *pro tem.* rank
Priya Nath Sen	Burma	Shwebo Division	Yeu	Assist. 2nd	
William Frederick Holms	Punjab Irrigation	Bari Doab Canal, 1st Div.	Gurdaspur	Assist. 2nd	
Hewley Mortimer Baines	Punjab	Rawul Pindi	Rawul Pindi	Assist. 2nd	
Frederick Robert Bäder	Bombay	Hyderabad Canals (Sind)	Hyderabad	Assist. 2nd	
		Assistant Superintendents, Telegraph Department.			
Ernest James Bonnell Hudson	Sind and Beluchistan	Quetta	Quetta	Asst. Supt., Cl. VI., 2nd Grade	
William Patrick Henderson	Assam	Shillong	Shillong	Asst. Supt., Cl. VI., 2nd Grade	
		Assistant Conservators, Forest Department.			
Bertram Beresford Osmaston, F.C.H.	Bombay	Working Plans	Poona	As. Consr. 1st	
Henry Haiselfoot Haines, F.C.H.	Bengal	Jalpaiguri	Jalpaiguri	As. Consr. 1st	
Archibald Vere Monro	Punjab	Direction	Lahore	As. Consr. 1st	
Herbert Carter	Burma	Working Plans	Toungoo	As. Consr. 1st	
Francis Joseph Branthwaite	Lower Burma	Tharrawaddy	Tharrawaddy	Dy. Consr. 4th	Officiating
Arthur Wharton Blunt	Central Provinces	Bilaspur Division	Bilaspur	As. Consr. 1st	
Ernest Adolphus O'Bryen	Upper Burma	Katha	Katha	As. Consr. 1st	
Charles D'Arcy McArthy	Madras	Vizagapatam	Vizagapatam	As. Consr. 1st	
William Frederick Loftus Tottenham	Lower Burma	Pegu	Pegu	As. Consr. 1st	
Henry Miles Thompson	Burma	.....	.....	As. Consr. 1st	Officiating. On leave

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		1889.			
Ernest Gray Coutts, F.C.H.	State Railways	Mari-Attock Exten. Ry.	Hurro	Assist. 2nd	
Edward Aylmer Lugard	Central Provinces	Nagpur	Nagpur	Assist. 2nd	
Francis Edward Bull	North-West Provinces and Oudh	Ganges Canal, Aligarh	Pilkatra	Assist. 2nd	
Frederick George Royal Dawson	State Railways	Mu Valley Railway	Katha	Assist. 2nd	
Alfred Ernest Cochemé	Punjab Irrigation	Sirhind Canal, Ferozpore	Asabutur	Assist. 2nd	
William Herbert Mills	Punjab	Rawul Pindi	Rawul Pindi	Assist. 3rd	
Lalit Mohan Bose	Bombay	Ahmednagar	Ahmednagar	Assist. 3rd	
Walter Jenkins	North-West Provinces and Oudh	Gorakhpur	Azimgarh	Assist. 2nd	
Oswald Sergeant Smith	Bengal	Brahminee Byturnee	Kendrapara	Assist. 2nd	
Arthur George Romilly	Madras	Rushikulya	Errendra	Assist. 2nd	
Otway Fortescue Luke Wheeler Cuffe	Burma	Third Circle	Mandalay	Assist. 2nd	
William John Joseph Howley	Madras	Godavery Western	Gunnaram	Assist. 3rd	
Geoffrey Frederick Henry Cather	Burma	Eastern Irrigation	Meiktila	Assist. 2nd	
		Assistant Superintendents, Telegraph Department.			
Richard Meredith	Punjab	Lahore	Lahore	Asst.Supt.,Cl. VI., 2nd Grd.	
Norman Uniacke Knox Leslie	.....	.....	.....	Asst.Supt.,Cl. VII., 1st Grd.	On furlough

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		Assistant Conservators, Forest Department.			
Arthur Pascoe Grenfell	N.W.P.	Saharunpur	Dehra Dun	As. Cons. 1st	
Anthony M. Caccia	Central Provinces	Hoshangabad	Hoshangabad	As. Cons. 1st	
William Herbert Lovegrove	Bengal	Singh-Chum	Chaibassa	As. Cons. 1st	
Geoffrey Rogers Long	Lower Burma	Agency Division	Tavoy	As. Cons. 2nd	
Peter Henry Clutterbuck	Central Provinces	Chindwara	Chindwara	As. Cons. 1st	
William Thomas Townley McHarg	Upper Burma	Lower Chindwin	Monywa	As. Cons. 1st	
William Francis Lloyd	.....	.....	.....	Dy. Cons. 4th	On nine months' sick
Charles William Agnew Bruce	Burma	Upper Chindwin	Kindat	As. Cons. 1st	[leave
Claude du Pré Thornton	Madras	Tinnevelly	Palamcottah	As. Cons. 1st	
Arthur Bushe Jackson	Madras	Godaveri	Coconada	As. Cons. 1st	
		1890.			
Alfred Ridley Walsh, F.C.H.	State Railways	East Coast Railway	Waltai	Assist. 3rd	
William Edward Gilbert Belcher	N.W.P. and Oudh	Benares	Mirzapur	Assist. 3rd	
Alfred William Evans Standley	ditto	Betwa Canal	Paricha	Assist. 2nd	
James Geoffrie Musgrave O'Hara	State Railways	Chittagong-Akyab-Minhla Railway Survey	.....	Assist. 3rd	
Robert Newby Hartley Reid	Madras	Kistna Eastern	Masulipatam	Assist. 3rd	
Robert Stuart Paterson	Punjab Irrigation	Sirhind Cl., Ludhiana div.	Dadahar	Assist. 2nd	
Frederick Wright	Bombay	Hyderabad Canals	Hyderabad	Assist. 2nd	
John Peake Wildeblood	N.W.P. and Oudh	Agra	Mainpuri	Assist. 3rd	
Francis Arthur Adam Cowley	Bengal Irrigation	Arrab, Sone Canal	Ramnuggur	Assist. 2nd	
John Zorab	ditto	Buxar	Monohorpore	Assist. 3rd	
John Vernon Griffin	Burma	.....	.....	Assist. 2nd	On furlough
William George Davie	ditto	Rangoon	Rangoon	Assist. 3rd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
Dalrymple Marshall	Madras	Tanjore	Tanjore	Assist. 3rd	
Francis Joseph Harvey	State Railways	N.W. Railway	Ara	Assist. 3rd	
Charles Peregrine Walsh	Assam	Manipur Road	Kohima	Assist. 2nd	Sub. *pro tem.* rank
		Assistant Superintendents, Telegraph Department.			
Charles William Sowerby-Coo	Oudh and Rohilkhand	Oudh and Rohilkhand	Lucknow	Asst.Supt.,Cl. VII., 1st Grd.	
Henry Mayston	Burma	Upper Burma	Mandalay	Asst.Supt.,Cl. VII., 1st Grd.	
		Assistant Conservators, Forest Department.			
Edward Mills Coventry	Punjab	Working Plans	Lahore	As. Cons. 2nd	
Joseph Messer	Burma	Toungoo	Toungoo	As. Cons. 1st	Officiating
Lionel Sherbrooke Osmaston	Bombay	Working Plans	Poona	Dy. Cons. 4th	Officiating
Richard McIntosh	Madras	Cuddapah	Cuddapah	As. Cons. 1st	
Charles Mortimer Hodgson	Madras	Working Plans	Belgaum	Dy. Cons. 4th	Officiating
Alfred Maule Burn-Murdoch	Upper Burma	Magwe	Toungdwingyi	As. Cons. 2nd	
George Frederick Fischer Foulkes	Madras	South Canara	Mangalore	As. Cons. 2nd	
Henry Hughes Forteath	Lower Burma	Paunglyn	Paunglyn	As. Cons. 2nd	
Horace B. Bryant	Madras	Coimbatore	S.Coimbatore	As. Cons. 1st	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		1891.			
George Richards, F.C.H.	State Railways	Burmah State Railway	Rangoon	Assist. 3rd	
James Henry Heap, F.C.H.	State Railways	Lucknow R.B.B. Ry.	Lucknow	Assist. 3rd	Attached to Office of Consg. Engr. for Rys., [Lucknow
60 Herbert Morton Willmott, F.C.H.	N.W.P. and Oudh	Bhognipur Div., Lower Ganges Canal	Zainpur	Assist. 2nd	
Horace Reginald Walton	State Railways	Mushkaf Bolan Railway	Pishi	Assist. 3rd	
Grey Hugh Morville Streatfeild	N.W.P. and Oudh	Etawah Div., Ganges Cnl.	Rura	Assist. 3rd	
Henry Charles Robertson	Punjab	Umballa	Karnal	Assist. 3rd	
Edward Arundel Smith	Bengal	Arrah	Nasraganj	Assist. 3rd	
Gordon Colet Laurie	Punjab	Bari Doab Canal	Amritsar	Assist. 3rd	
Llewellyn William Lewis	Burma	Amherst	Moulmein	Assist. 3rd	
Claude Whately Johnson	Punjab	Bari Doab Canal	Mian Mir	Assist. 3rd	
Patrick Joseph Corbett	Bombay	Satara	Satara	Assist. 3rd	
Edwin George Gahagan	Bombay	Fuleli Canals	Hyderabad	Assist. 3rd	
70 John Henry White	Burma	Mandalay Civil	Mandalay	Assist. 3rd	
William Hutton	Madras	Tinnevelly	.....	Assist. 3rd	
Archibald Henry Morin	Madras	Kistna Eastern	Bezvada	Assist. 3rd	
		Assistant Superintendents, Telegraph Department.			
William Sutherland	Nagpur	Bengal-Nagpur Railway	Nagpur	Asst. Supt. Cl. VII. 1st Grade	
Lionel Truninger	Assam	Assam	Shillong	Asst. Supt. Cl. VII. 1st Grade	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
		Assistant Conservators, Forest Department.			
Frederick Alexander Leete, F.C.H.	N.W. Provinces	Naini Tal	Naini Tal	As. Cons. 1st	
Samuel Carr, F.C.H.	Upper Burma	Yamethin	Yamethin	As. Cons. 2nd	
John Cromarty Tullock	N.W. Provinces	Gorakhpur	Gorakhpur	As. Cons. 1st	Officiating
Henry Scott Ker Edie	Assam	.....	.....	As. Cons. 2nd	On leave
Charles Clark Hatt	Bengal	.....	.....	As. Cons. 1st	On deputation
Frederick Trafford	Bengal	.....	.....	As. Cons. 2nd	On sick leave
William Frederick Derry Fisher	Bombay	Panch Mahals	Godhra	As. Cons. 1st	
Owen Lloyd Hownam Napier	Bombay	Naushahro	Naushahro	As. Cons. 1st	
Arthur Marcus Long	Assam	Garo Hills	Tura	As. Cons. 2nd	
John Lewis MacCarthy O'Leary	Madras	Ganjam	Russellkonda	As. Cons. 2nd	
Francis Loftus Cowley Cowley-Brown	Madras	Salem	Denkanikota	As. Cons. 2nd	
		1892.			
George Ernest Lillie, F.C.H	State Railways	Mari-Attock Railway	.....	Assist. 3rd	
Edmund Algernon Coryton Lister, F.C.H.	State Railways	Mushkaf Bolan Railway	.....	Assist. 3rd	
Alexander Charles Hermann Laurie, F.C.H.	N.W. Provinces and Oudh	.....	.....	Assist. 3rd	
Charles Alexander Fleming	Punjab Irrigation	Chenab Canal, 2nd Div.	.....	Assist. 3rd	
John Lamplow Morres	Bombay	Surat and Broach	.....	Assist. 3rd	
Joseph Meli	Punjab Irrigation	Chenab Canal, 2nd Div.	.....	Assist. 3rd	
Thomas Barclay Robertson	Bombay	Sholapur	.....	Assist. 3rd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
James Lindsay Stirling	Burma	.....	.....	Assist. 3rd	Irrigation
James Matthew Marmaduke Parker	Madras	Godaveri Eastern	.....	Assist. 3rd	
Antoine René de Chazal	Madras	Fourth Circle	.....	Assist. 3rd	
Charles William Sibold	Bengal	.....	.....	Assist. 3rd	Irrigation
Percy Frederic Wickham	Burma	.....	.....	Assist. 3rd	
	Assistant Superintendents, Telegraph Department.				
Herbert Aubrey Armstrong	Bombay	Poona	Poona	Asst.Supt. Cl. VII.,2nd Gde.	
Stephen Babington	Nagpur	Nagpur	Jubbulpore	Asst.Supt. Cl. VII.,2nd Gde.	
		1893.			
Joseph Coates, F.C.H.	State Railways	.....	.....	Assist. 2nd	Under Practical Training in England.
Bryan Stapleton, F.C.H.	State Railways	.....	.....	Assist. 2nd	
William Sullivan	N.W. Provinces and Oudh	.....	.....	Assist. 2nd	
William Herbert H. Smith	Punjab	.....	.....	Assist. 2nd	
Charles Ernest Hall	N.W. Provinces and Oudh	.....	.....	Assist. 2nd	
Frederick St. John Gebbie	Bombay	.....	.....	Assist. 2nd	
Robert Jackson Kent	Bombay	.....	.....	Assist. 2nd	
Alexander Shirley Montgomery	Punjab	.....	.....	Assist. 2nd	
Edward Blaber	Bengal	.....	.....	Assist. 2nd	
Frank Furnivall	Madras	.....	.....	Assist. 2nd	
Frederick Reily Collins	Burma	.....	.....	Assist. 2nd	
Walter Charles Stanton	.....	.....	.....	Assist. 2nd	

Name.	Province or Branch of the Service.	Division.	Station.	Grade.	Remarks.
Mathew Alfred Thompson	Madras	East Coast	Vizagapatam	Asst. Supt. Cl. VII., 2nd Gde.	
John James Rudall Overton	Madras	Madras	.....	Asst. Supt. Cl. VII., 2nd Gde.	
Henry Swetenham Pike	Electrician's Office	.....	Calcutta	Asst. Supt. Cl. VII., 2nd Gde.	
		Assistant Conservators, Forest Department.			
Herbert George Billson, F.C.H.	N.W. Provinces	Direction	Dehra Dun	A.Con.2ndGd.	
Conant Charles Abbey, F.C.H.	N.W. Provinces	Kheri	Lakhimpur	A.Con.2ndGd.	
Robert Marshall Williamson	Berar	Ellichpur	Ellichpur	A.Con.2ndGd.	
Robert Cecil Millward	Central Provinces	Betul	Betul	A.Con.2ndGd.	
Frederick Linnell	Central Provinces	Direction	Nagpur	A.Con.2ndGd.	
Clarence Oldham Hanson	Central Provinces	Direction	Nagpur	A.Con.2ndGd.	
George Richard Duxbury	Bombay	Thana	.....	A.Con.2ndGd.	
Hugh Alison Latham	Madras	N. Coimbatore	.....	A.Con.2ndGd.	
Walter Francis Perrée	Bengal	Darjeeling	Darjeeling	A.Con.2ndGd.	
Charles Bertram Smales	Burma	L. Chindwin	Monywa	A.Con.2ndGd.	
Stephen Cox	Madras	Kistna	.....	A.Con.2ndGd.	
Edward Percy Stebbing	Bengal	Singhbhum	Chaibassa	A.Con.2ndGd.	
Hugh Francis A. Wood	Madras	Cuddapah	.....	A.Con.2ndGd.	
Henry Tireman	Madras	S. Canara	.....	A.Con.2ndGd	
Francis Edward B. Lloyd	Assam	Goalpara	Dhubri	A.Con.2ndGd.	

THE ROYAL INDIAN ENGINEERING COLLEGE.

JULY 1894.

LIST OF ENGINEER STUDENTS passed for the INDIAN PUBLIC WORKS DEPARTMENT at the Examination of July 1894; showing also the Provinces or Branches to which they severally apply to be posted.

Position in Examinations.	Name.	Province or Branch of Department.	Remarks.
	Assistant Engineers, Second Grade.		
*†‡§ 1	RIDDELL, W. J., *F.C.H.*	North-West Provinces and Oudh	
*‖ 2	Campbell, J. G., *F.C.H.*	Punjab	Did not pass medical examination. Accepted subsequently for Public Works other than Railways.
*¶** 3	YOUNG, J. A. F., *F.C.H.*	State Railways	
4	McKenzie, A. L.	State Railways	
5	Kanthack, F. E.	Punjab	
†† 6	Sangster, W. P.	Bombay	
7	Shoubridge, H. O. B.	Bombay	
8	Benwell, G. L.	Bengal	
9	Dowrie, G. A.	Burma	
10	*Pope, H. N.*	.....	Refused Indian appt.
11	Samuelson, B. H.	Burma	
12	Kharegât, H. R.	Madras	
13	Edge, R. C.	Madras	
	Assistant Superintendents, Telegraph Department.		
1	Landon, G. E.	.....	Proceed direct to India.
2	Roy, G. P.	.....	
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ARITHMETIC AND MENSURATION.

[Time, 2½ hours.]

1. Find the value of—
$(2\frac{1}{2} + 3\frac{1}{6})\ (2\frac{1}{7} - 5\frac{1}{3} + 6\frac{4}{21})\ (2\frac{5}{6} - 1\frac{1}{2}) \div (1\frac{1}{6} - \frac{1}{30})$.

2. Express as a decimal $(1 + \frac{1}{20})\ (3 - \frac{3}{400} - \frac{1}{2000} - \frac{7}{1000000})$, and also $(3 + \frac{1}{7})\ (1 - \frac{4}{100000})$.

3. Find the square root of 246·1761. 15.69

4. If a merchant buys goods for £187 5s. 0d., and sells them for £215 6s. 9d., what is his gain per cent. ?

5. Find the area of the trapezium *A B C D* whose sides *AD*, *BC* are parallel at a distance apart of 1 foot, *BC* being 8 inches longer than *AD*, and the area of the triangle *ABC* being 150 square inches.

6. A rectangle 6 inches broad is inscribed in a semicircle whose diameter is 12 inches. Find the area of the rectangle, and the areas of the several parts of the semicircle outside the rectangle.

7. A cone 18 inches high, and the radius of whose base is 6 inches, stands on a hemisphere of the same radius. Find the volume of the solid.

8. A hollow dome in the form of a spherical segment is 18 feet high, and the diameter of its base is 24 feet. Find its volume, and its surface.

9. Find the volume of a wedge, the distances between its parallel sides being 25, 25, and 14 inches respectively, and their lengths being 12, 16, and 20 inches respectively.

10. Find the volume of the frustum of a pyramid whose parallel ends are similar triangles of areas 50 and 18 square feet respectively, the height of the frustum being 6 feet.

ALGEBRA.

1. Express the product $(a_1 + b_1\sqrt{-1})(a_2 + b_2\sqrt{-1})$ in the form $A + B\sqrt{-1}$.

2. Solve the equation $\dfrac{2x - 2\frac{1}{3}}{3x + 1} - \dfrac{\frac{3}{5}x + \frac{1}{2}}{x - \frac{5}{4}} = -2.$

3. Find the greatest common measure of—
$x^5 - 4x^4 + 2x^3 + 3x^2 - 6x - 2$, and $2x^4 - 6x^3 - x^2 - 3x - 1$.

4. Form the equation whose roots are—
$-4, -2, 3 + 2\sqrt{-1}$, and $3 - 2\sqrt{-1}$.

5. Find x and y from the equations—
$$x^3 = 17x + 4y,$$
$$y^3 = 4x + 17y.$$

6. Find x, y, z from the equations—
$$4x - y - z = -5,$$
$$-2x + 3y + 4z = 9,$$
$$x - 5y - 3z = 2.$$

7. Solve the equation—
$x^4 + x^3 - 3x^2 + x + 1 = 0$ by assuming $x + \dfrac{1}{x} = y$.

8. Solve the equations—

$$2x^2 - 6x + 5 = 0,$$

$$x - 1 = 2 + \frac{2}{\sqrt{x}},$$

$$\frac{a + x + \sqrt{2ax + x}}{a + x - \sqrt{2ax + x^2}} = b^2.$$

9. If the equations $ax^2 + bx + c = 0$ and $a^1x^2 + b^1x + c^1 = 0$ have a root in common, show that $(ac^1 - a^1c)^2 = (ab^1 - a^1b)(bc^1 - b^1c)$.

10. The first term of an arithmetic series is 7, the common difference is 3; how many terms must be taken so that their sum shall be 171?

11. Find the sum of 8 terms of the series $3 + \frac{3}{2} + \frac{3}{4} + \frac{3}{8} + \ldots$.

Find the sum of an infinite number of terms of a decreasing geometric series.

GEOMETRY.

1. Prove that the difference between any two sides of a triangle is less than the third side.

2. Prove that the bisectors of the angles of a plane triangle meet in a point.

3. Let the base AB of a triangle be divided at P so that $\frac{AP}{PB} = \frac{m}{n}$. Prove that—

$n \cdot AC^2 + m \cdot BC^2 = n \cdot AP^2 + m \cdot BP^2 + (m + n) \cdot PC^2$.

Hence, given the base and the sum of the squares of the sides of a triangle, find the locus of the vertex.

4. Prove that the rectangle under the sum and difference of two right lines is equal to the difference between their squares.

5. Show that if a quadrilateral is inscribable in a circle, the sum of a pair of opposite angles must be two right angles.

6. If a line drawn from P cuts a circle in A and B, prove that the rectangle under PA and PB is equal to the square of the tangent from P.

Describe a circle through two given points so as to touch a given right line.

7. Circumscribe a circle round a given triangle ABC.

If p is the perpendicular from C on AB, show that the radius R of the circumscribing circle is given by the equation—

$$R = \frac{AC \times CB}{2p}.$$

8. Prove that the bisector of any angle of a triangle divides the opposite side into segments proportional to the adjacent sides.

Given the base AB, and the ratio $AC : BC$ of the sides, find the locus of the vertex C.

9. Prove that the areas of similar triangles (and of similar figures in general) are proportional to the squares of corresponding sides.

TRIGONOMETRY AND LOGARITHMS.

[Time, 3 hours.]

1. If $\tan x = \frac{3}{4}$, find $\sin x$, $\sin 2x$, and $\cos 3x$.

2. Find the circular measure of $33° 15'$, and the number of degrees, minutes, and seconds in $0{\cdot}4$ of a radian.

3. Prove that—

(1) $\text{Cos } A \cos (B + C) - \cos B \cos (A + C) = \sin (A - B) \sin C$.

(2) $\text{Sin}^2 A - \sin^2 B = \sin (A + B) \sin (A - B)$.

4. Prove that $\tan^{-1}\frac{5}{12} + \tan^{-1}\frac{3}{4} = \tan^{-1}\frac{16}{33}$.

5. Prove that the area of a triangle $= \frac{1}{2}$ product of two sides into sine of included angle. Express the area in terms of one side and the angles.

6. Prove that, in a triangle ABC—

(1) $a = b \cos C + c \cos B$.

(2) $\text{Tan}^2 \frac{A}{2} = \frac{(s-b)(s-c)}{s(s-a)}$

(3) $\text{Tan} \frac{B-C}{2} = \frac{b-c}{b+c} \cot$

7. At a point 367 feet from the base of a col elevation of its summit is 31° 13′ 20″. Find column.

8. Find x from the equation $x^5 = 3 \tan 3° 1$

9. Prove that $\log_e x = \log x \div \log a$.
Find $\log_e \pi$, where $e = 2{\cdot}71828$, and $\pi = 3{\cdot}1$

10. In a triangle ABC, if $BC = 37{\cdot}5685$ fe $C = 52° 3′ 52″$, find CA and AB.

GEOGRAPHY AND HISTO

[Candidates may answer in Geography, or at their pleasure.]

[Time, including that for dictation, one hour a

GEOGRAPHY.

1. Explain the following terms:—

a. Horizon.
b. The cardinal points.
c. The earth's axis.
d. Parallels of latitude.
e. Meridians of longitu
f. The tropics.
g. The ecliptic.
h. The equinox.
i. The solstices.
j. The zodiac.

2. Draw a diagram showing how an eclip caused.

3. Where are the following places, and for what are they best known?—

a. Manilla.
b. St. Helena.
c. Bergen.
d. Riga.
e. Astrakhan.
f. Strassburg.
g. Zurich.
h. Toulon.
i. Tokay.
j. Xeres.

4. Draw a map of Canada, showing its provinces, with their capital towns; and also its principal rivers, mountains, and lakes.

5. Whence do we get the following commodities?—

a. Wheat.
b. Tobacco.
c. Tea.
d. Coffee.
e. Cocoa.
f. Wine.
g. Spirits.
h. Fish.
i. Fruit.
j. Petroleum.

HISTORY.

1. How and when did England obtain possession of the following?—

a. Gibraltar.
b. Burma.
c. Newfoundland.
d. Cape Colony.
e. Australia.

2. What were the principal provisions of the Union between England and Scotland?

3. How is the money found to carry on the Government of the United Kingdom?

4. Give a slight sketch of Mr. Gladstone's political career.

5. Explain briefly the following terms:—

a. The National Debt.
b. The Five-mile Act.
c. The Restoration.
d. Cabinet Council.
e. County Council.
f. County Court.
g. The Act of Settlement.
h. The Rye House Plot.
i. Convocation.
j. Scotland Yard.

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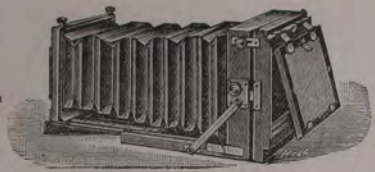

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40th (Infantry)	Mr. K. C. Coldwell..... 1,784		

SANDHURST, JUNE, 1894.

FIRST Mr. R. R. Garratt	10,282	83rd (Infantry).....	Mr. G. C. Garratt..... 8,214
FIRST (West India) ..	Mr. H. N. Corbett 9,041	71st (Infantry).....	Mr. W. A. I. Kay 8,140
11th (Infantry)	Mr. J. A. Innes 8,457	83rd (Infantry).....	Mr. J. H. Davidson 8,041
24th (Infantry).....	Mr. E. E. Williams 8,919	Cavalry	Mr. A. Seymour 7,721
28th (Infantry).....	Mr. S. F. Heard..... 8,887	Cavalry	Mr. C. E. B. Yeates 6,968
39th (Infantry).....	Mr. C. L. Peart 8,606	Queen's India Cadet ..	Mr. O. H. N. Newmarch 4,617
60th (Infantry).....	Mr. L. St. H. Morley .. 8,229		

FIRST ON THE WHOLE LIST.

WOOLWICH, JUNE, 1894.

24th	Mr. C. J. Juhan 9,249

MILITIA LITERARY, APRIL, 1894.

3rd	Mr. H. T. Reed 6,262	34th	Mr. W. H. Pease 4,861
33rd	Mr. A. E. Venning 4,498		

MILITIA COMPETITIVE, MARCH, 1894.

28th (Infantry).....	Mr. A. Goring 1,815	8th (University).....	Mr. H. J. P. Beresford.. 1,348
32nd (Infantry).....	Mr. A. F. Townshend .. 1,805	— (Cavalry)	Mr. T. M. S. Pitt 1,667
5th (University).....	Mr. F. E. Whitton 1,638	— (Cavalry)	Mr. W. B. Andrew 1,656

MILITIA COMPEITIVE, SEPTEMBER, 1893.

1st (University)	Mr. H. Garraway.	15th (Infantry).....	Mr. D. D. Gunn
4th (Cavalry)	Mr. T. Sladen.	29th (Infantry).....	Mr. S. Moore.
12th (Infantry).....	Mr. G. Morley.	40th (Infantry).....	Mr. J. Blair.

ARTILLERY COLLEGE, SENIOR CLASS. Captain M. B. Lloyd, R.A.

NEW COMPETITION, DECEMBER, 1893. Captain L. T. Pease, R.M.A.

SANDHURST, DECEMBER, 1893.

12th (Cavalry).....	Mr. R. S. V. Dyas 6,545	7th (University)	Mr. A. G. Stuart 6,685
12th (Infantry).....	Mr. S. M. Taheurdin.... 7,815	*86th (Infantry).....	Mr. C. J. Griffin 6,671
24th (Infantry)	Mr. F. P. Braithwaite .. 7,040	*— (Cavalry)	Mr. C. S. Nesham 6,327
44th (Infantry)	Mr. A. W. D. Gaussen .. 7,147	*— (Cavalry)	Mr. W. C. T. Plant 6,2 3
79th (Infantry)	Mr. G. L. Gregory 6,752	* Subsequently Admitted.	

STAFF COLLEGE, JUNE, 1894.

TWENTY of OUR PUPILS were ADMITTED.

For the past THREE years ALL the SUCCESSFUL ARTILLERY OFFICERS have read with us.

LIST OF SUCCESSES, STAFF COLLEGE, 1894.

Capt. E. M. Percival	Royal Artillery.	Lieut. H. S. Walker	2nd Batt. Scottish Rifles.
Lieut. W. A. M. Thompson	Royal Artillery.	Capt. W. C. Bridge	2nd Batt. S. Staffordshire Regt.
Lieut. H. L. Tennant	Royal Artillery.	Capt. H. Jennings-Bramley	1st Batt. Syl. Highlanders.
Capt. W. Kwbank	Royal Engineers.	Capt. R. J. Strachey	2nd Batt. Riff.-Brigade.
Lieut. S. Earle	2nd Batt. Coldstream Guard.	Lieut. E. E. Carter	Army Service Corps.
Capt. N. H. Verne	2nd Batt. E. Kent Regt.	Capt. H. W. L. Holman.	Royal Marine Light Infant'y.
Major B. St. J. Barter	2nd Batt. Lincolnshire Regt.	Lieut. C. H. Clay	Indian Staff Corps.
Capt. J. R. F. Sladen	2nd Batt. E. Yorkshire Regt.	Lieut. J. K. Tod	Indian Staff Corps.

SPECIALLY NOMINATED by H.R.H. the Duke of Cambridge.

Ca t. the Hon. H. A. Lawrence	17th Lancers.	Lieut. F. S. Maude	2nd Batt. Coldstream Guards.
Capt. H. J. Du Cane	Adjutant Royal Horse Artillery.	Capt. H. B. Wise	2nd Batt. Derbyshire Regt.

The following FOURTEEN OFFICERS also QUALIFIED for Admission from our Classes.

Capt. W. H. Birkbeck	1st Dragoon Guards.	Lieut. W. Maclarlan	2nd Batt. Royal Highlanders.
Capt. N. D. Findlay	Royal Artillery.	Brevet-Maj. H. N. C. Heath.	1st Batt. Yorkshire Lt. In.
Lieut. G. D. Symonds	Royal Artillery.	Capt. A. F. Randolph	1st Batt. Middlesex Regt.
Capt. J. G. King-King	1st R. W. Surrey Regt.	Capt. F. F. Blakeney	Army Service Corps.
Lieut. D. Macworth	2 d R. W. Surrey R gt	Lieut. W. C. Knight	Indian Staff Corps.
Capt. H. T. Godden	2nd Batt. Bedfordshire Regt.	Lieut. M. E. Willoughby	Indian Staff Corps.
Lieut. G. W. Dundas	2nd Batt. Bedfordshire Regt.	Lieut. C. E. E. F. K. Macquoid	Indian Staff Corps.

At the RECENT EXAMINATIONS for WOOLWICH and SANDHURST, held June, 1894, the following High Places were gained by our Pupils:—First in French; First in Geology; First in Latin; Second in Greek; Second in Geography; Third in History (twice).

And in 1893 our pupils gained the following places in the special subjects referred to:—

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FIRST (949 marks), SECOND (918) in GEOMETRICAL DRAWING among the successful SANDHURST Candidates.

FIRST in GEOGRAPHY and GEOLOGY for SANDHURST.

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2nd	Mr. J. C. Milling..... 1,246		

PUBLIC COMPETITION FOR SIX CADETSHIPS.

3rd	Mr. P. Gordon 1,358	5th	Mr. N. R. T. Gregory 1,327
4th	Mr. J. M. P. O'Shee 1,346	6th	Mr. G. F. W. Craig 1,321

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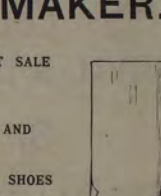

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