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Public Works (1896) Department.

27th 27th

G.O., No. 3035 W
&
3036 W

DATED 26" october 1896

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[Despatch Abstract.]

Practical Course: Stating that His Excellency the Governor in Council sees no reason to differ from the conclusions arrived at by the Chief Engineer in regard to ~~Connection with~~ the proposal to abolish the year's — in England of successful Coopers Hill Students and directing that the Govt. of India be informed accordingly

Practical Course: Stating that H.E. the Governor in Council sees no reason to differ from the conclusions arrived at by the Chief Engineer in regard to the proposal to abolish the year's — in England of successful Coopers Hill Students

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[P. W. 26.
500—15-8-96.]

T.C. 26/10

Indexed 26/10

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GENERAL.
ESTABLISHMENT.

Government {1896} of Madras.

PUBLIC WORKS.

Recd.	1896.	*Enclosures*	
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Letter, No. 3036 W., 26th October 1896.

OCTOBER.

Practical Course

Stating that His Excellency the Governor in Council sees no reason to differ from the conclusions arrived at by the Chief Engineer in regard to the proposal to abolish the year's — in England of successful Cooper's Hill students.

PUBLIC WORKS DEPARTMENT.

General.
Establishment.

LETTER—from

THE HON'BLE COLONEL D. McNEIL CAMPBELL, R.E.,
Secretary to the Government of Madras,
Public Works Department,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
PUBLIC WORKS DEPARTMENT.

SIR,

With reference to your letter No. 1963 G., dated 6th August 1896, I am directed to forward a copy of the Proceedings of this Government, No. 3035 W., dated 26th October 1896, embodying the opinions of six selected officers of the Madras Public Works Department on the proposal to abolish the year's practical course in England of successful students of the Coopers Hill College; also a précis of those opinions and a note on the subject by the Chief Engineer, and to state that His Excellency the Governor in Council sees no reason to differ from the conclusions arrived at by the Chief Engineer.

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

Colonel, R.E.,
Secretary to Government.

FORT ST. GEORGE,
26th October 1896.

Exd. Md. Pahilvan.

GENERAL.
ESTABLISHMENT.

Government {1896} of Madras.

PUBLIC WORKS.

Recd. } 1896. *Enclosures*
Regd. } *Spare copies*

G.O., No. 3035 W., 26th October 1896.

OCTOBER.

Practical Course

Stating that His Excellency the Governor in Council sees no reason to differ from the conclusions arrived at by the Chief Engineer in regard to the proposal to abolish the year's — in England of successful Coopers Hill students, and directing that the Government of India be informed accordingly.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

General, Establishment.

READ—the following paper :—

From Colonel M. W. BISSET, R.E., Secretary to the Government of India, Public Works Department (General), to the Secretary to the Government of Madras, Public Works Department, dated Simla, the 5th August 1896, No. 1963 G.

I am directed to inform you that the Government of India have before them a suggestion that the practice of detaining passed students of the Coopers Hill College for a year's practical course in England, after they have completed their college course, should now be abandoned.

2. It is stated that the knowledge of engineering methods gained by these students during their practical course is not only incommensurate with the time spent thereon and with the attendant expense to the State, but also that such experience can as readily be acquired by the young engineer on works in India without any preliminary practical course in England.

3. It is not suggested that a practical course in India should take the place of a practical course in England, but simply that the latter should be abolished and that Coopers Hill Engineers should proceed to India and begin, on works there, to learn the practical side of their profession so soon as they have completed their College course at Coopers Hill.

4. A suggestion has also been made that selected passed students might be permitted to undergo a course of workshop practice in England, but that only those who may have exhibited a special aptitude for mechanical pursuits should be so selected and trained.

5. It is admitted that, after a certain experience of Indian Engineering has been acquired, it is desirable that officers of the Public Works Department should acquaint themselves with English practice, as they will then, with their Indian experience, be in a position to adapt such practice to Indian requirements.

The Government of India therefore hold that every facility and encouragement should be given to officers on furlough to study those works on which they would gain experience likely to be of use to them in the particular branch of engineering they may have adopted in India or for which they may have exhibited a natural aptitude.

6. Before coming to any decision regarding the proposal to abolish the practical course the Government of India desire to consult Local Governments and Administrations as to the results of their experience, and I am accordingly to request that with the permission of His Excellency the Governor in Council they may be favoured with the opinion of the Local Government and of any selected officers whom the Local Government may consult on the proposal.

From A. A. G. MALET, Esq., Executive Engineer, Coimbatore Division, to the Chief Engineer and Joint Secretary to Government, Public Works Department (through the Superintending Engineer, IV Circle), dated Pykara, 16th September 1896, No. 3060.

In reply to your No. 1183 D., dated 28th August 1896, I have the honour to report as follows.

2. I am of opinion that the knowledge of engineering methods gained by passed students of Coopers Hill College during their practical course in England is not commensurate with the time spent thereon and with the attendant expense to the State, but I do not think, as stated in paragraph 2 of the Simla Memorandum, that the experience gained in England can be acquired as readily by the young engineer on works in India.

3. I am also of opinion that it would not be advisable to substitute a practical course in India if the practical course in England is abolished.

4. I entirely concur with the remarks in paragraph 5 of the Simla Memorandum, and consider that special facilities and inducements should be offered to officers on furlough to study works in England, on the continent or elsewhere.

5. It is difficult to lay down a hard and fast opinion to cover the widely varying exigencies of the different branches of the service in this country, but I feel sure that in all branches, even including Sanitary Engineering, an officer could gain a great deal more knowledge in a given time if he studied works at home after some years' practical work in this country, than as a student.

6. A young engineer is not called on to design or be responsible for the carrying out of works when he first joins, and the time when this responsibility falls on him is approximately coincident with his first furlough, if he can afford to take it.

7. An officer should know how to handle ordinary tools when he comes out, and this knowledge can be gained at Coopers Hill College.

8. The proportional cost of land, labour, materials and supervision is so different at home to what it is out here, that entirely different methods have to be adopted for ordinary work in the two countries. The student is unable to discriminate between what will be and what will not be useful to him out here and it follows that the greater part of his time, during his practical course at home, is wasted.

It also follows that the methods employed in England cannot (except on special works) be acquired out here, but as these methods are not, as a rule, suitable for this country, this is immaterial.

9. My remarks do not of course apply to very special branches such as electrical engineering, mining, &c., these must be studied at home.

10. Whether the practical course at home is abolished or not, I am sure it would be in the interest of Government, if special encouragement was offered to induce officers to study works whilst on furlough.

The present practice of paying actual expenses, if notes are sent in, is not sufficient. Notes must of course be insisted on, but, in addition to actual expenses, a small honorarium should be offered if the notes are passed and a larger honorarium, up to a certain limit, if the notes are considered decidedly useful and show that considerable time and pains have been devoted to collecting the knowledge embodied in them.

The notes could be examined and the honorarium recommended by any senior officer on furlough, who applied for and was considered fit for the work, in the same way as a senior officer is now appointed to supervise the students of Coopers Hill College during their practical course.

11. I venture to make the remarks contained in the last paragraph from my personal experience. When on furlough in 1890, I received permission and assistance from the India Office to visit several works.

I took rough notes, but the prospect of bare actual expenses was not sufficient to make me spare the time and take the trouble of putting them into suitable form for submission to the India Office.

No. 465 W.

Forwarded.

(Signed) J. HANNAN,
Suptg. Engineer, IV Circle.

23rd September 1896.

From H. H. O'CONNELL, Esq., Executive Engineer, Salem Division, to the Superintending Engineer, IV Circle, dated 10th September 1896, No. 331-S.E.

With reference to Chief Engineer's Memo. No. 1183-D., dated 28th August 1896, I am of opinion that the so-called practical course now gone through by Coopers Hill students is as, a rule, of very little use in fitting them for the work they have to do out here. It may be of use to those employed in the Railway Department, but of little or no use to those employed in the Irrigation Department. The sooner men destined for the Irrigation Department come out, the sooner will they become useful members of the Irrigation Department of the Public Works Department. I therefore am of opinion that, as far as concerns the Irrigation Department, the practical course at home should be abandoned.

No. 453 W.

Forwarded to the Chief Engineer, Public Works Department, with reference to his No. 1183-D., dated 28th August 1896.

(Signed) J. HANNAN,
Suptg. Engineer, IV Circle.

15th September 1896.

From W. C. DEMORGAN, Esq., Executive Engineer, Ganjám Division, to the Superintending Engineer, I Circle, dated 8th September 1896, No. 2948.

With reference to your No. 413 G.L., dated 3rd September 1896, on Chief Engineer's No. 1183, dated 28th August 1896, I have the honour to inform you that, as far as my personal experience is concerned, the so-called, "practical course" before leaving Coopers Hill served no useful purpose.

2. As far as I can recollect the future career in India of the passed student received no consideration, and a man who was ultimately posted to the Bengal irrigation system was very probably sent to Crewe workshops, while another who in India subsequently connected himself with railway enterprise might have received his practical training on a system of municipal water-works. I recollect that my practical course was on a newly opened line of railway. I have never had anything to do with railways subsequently in or out of India.

3. I do not deny that the mental and professional capabilities of a student may be materially improved by a course of practical training in any branch of engineering science, and doubtless if during his course he really takes every advantage of his opportunities, he will feel the benefit in after life. Of course, the curriculum at Coopers Hill has greatly changed since I was there; but in my time, as far as I can recollect, it was only very exceptional students, who were in a frame of mind to reap much benefit from any practical course, so long as they secured their appointments.

4. In my opinion it would be far better to despatch your neophyte directly he has passed out of Coopers Hill straight to India, and put him on a practical course extending to a year or even more in the particular branch of the department in which he is to serve. If he is to belong to the Irrigation branch, he should see as many of the best types of work construction and work maintenance in the North and South of India. If he is to be attached to railways he should have the opportunity of obtaining some insight into survey, construction and management of open lines of railway.

5. But after his branch has been decided on, his practical course should be rigidly limited to that branch. Ordinary engineering and mechanical details are the same for all branches, and a man will measure up earthwork as well for a canal as a railway embankment.

6. After a student has had five or six years work in India he will have shown what stuff there is in him; and it is then, as I take it time enough to give him a chance of gaining extended practical experience. He will now have gained, if he has used his opportunities, some idea of how engineering projects are worked, and will probably fondly imagine that India possesses all the engineering knowledge in the world—particularly as regards "Irrigation." Now is the time to enlarge his mind and introduce new ideas. His furlough approaches; so let every facility be afforded for inspecting the irrigation systems of Western countries, the river systems of Italy, the reservoirs of France, and the huge water-supply arrangements in Great Britain. If he belongs to the railway, in any of the three branches (survey, construction or open line), I would suggest to give him every facility for making himself acquainted with American Engineers, their advanced ideas and rapid methods of construction; and I most cordially agree with paragraph 5 of the G.O., No. 1963 G., dated 5th August 1896, in which it is suggested that every facility should be given to officers on furlough to study works on which they may gain experience in their particular branch of engineering in England and in foreign countries.

7. And I further think that very particular concessions should be made, and ample facilities offered to enable such officers to make the best use of their opportunity, but at the same time, I would point out that such concessions and opportunities should not be granted to every Coopers Hill student who has completed a particular time of service, but only to such as have proved themselves good servants to Government. It is unfortunate to be obliged to remark that the suggestions I have offered might lead to grave abuse of Government interests; but like many other similar cases, *rules* can do no good, and the principle of competent selection is all important. It is hardly necessary for me to suggest a recent instance in connection with coast lighting, which, as far as I can judge, will bear most valuable fruit.

8. As regards paragraph 4 I have no experience in workshop practice; generally ordinary purposes are served by a very low standard of skill—in fact the ordinary smith maistry, combined with some place where screws may be turned, will do all that is wanted. Moreover, there are so many well appointed firms in Madras, Bombay and Calcutta that special mechanical aptitude for purely Government workshops appears to me unnecessary.

No. 444 G.L.

Forwarded in original to the Chief Engineer, Public Works Department, with reference to his No. 1183-D., dated 28th August 1896.

(Signed) J. C. LARMINIE,
Superintending Engineer, I Circle.

12th September 1896.

From A. T. MACKENZIE, Esq., Executive Engineer, Chingleput Division, to the Chief Engineer, Public Works Department (through the Superintending Engineer, V Circle), dated Chingleput, 7th September 1896, No. 1784.

In reply to your Memo. No. 1183-D. of 28th August 1896, I have the honour to enclose a short note embodying some of the views which have been impressed on me in India concerning the practical course prescribed for students after leaving Coopers Hill.

Enclosure.

Note on course of Instruction at Coopers Hill.

As a general statement it may be said that students at Cooper's Hill are divided into two classes, those with a pronounced mechanical bent and those with more aptitude for Civil Engineering. The scope for the former in India is extremely limited and it is obvious that in the interests of India a few only should receive extraordinary education in that direction. For this purpose India cannot be said to be the best or even a good school. Knowledge is gained by trial and error, a costly process, and the ultimate acquirement is often of a desultory nature, incomplete and unscientific, unaided by the traditions of English practice and by the competition which forms them. Such students should undoubtedly receive a practical training in England, and for this purpose one year is not long enough. It should be two years and it should be extensively varied. Such men again are wasted on the ordinary work of an Engineer in India. They should be kept if possible entirely for the duties to which they are best suited. Even if these duties were sometimes below their capacity the Government would be well repaid in economy and good management.

For the other class a practical course in England is in my opinion unnecessary. Work in India, taken as a whole, is very different from that in England in the manner of execution. Where an Engineer in England would use machinery one in India would use coolies, where one would use Portland cement the other would have to be content to mix surki with his lime, where one can trust his clerk of works the other can trust no one, where one relies on a contractor the other must be his own contractor often and always his contractor's Engineer, and so on. Instances might be indefinitely multiplied, but the fact is too well-known to need illustration. On this ground then it is evidently better that a young Engineer should gain his initial experience among the materials he will have to work with, and not among conditions very dissimilar; and if he is placed under reasonable supervision in a position of some responsibility he will acquire details more quickly and more thoroughly and not be disheartened by the difference between English and Native labour and, still more, English and Native subordinates. I do not wish to deny that in methods of execution there is much to be learnt at home. Methods in India now are very like those in vogue in England in the fifties, or forties, or earlier, but with the improvement of communications the possibilities of mechanical aid become vastly easier, and it is most necessary that officers should be acquainted with all improvements of value. But even in this the benefit is likely to be far greater when the officer is in a position to discriminate between what is and what is not likely to be useful. The value of English works, however, to an Indian Engineer lies more in design than in execution, and such matters a young man fresh from college is hardly in a position to comprehend, having no idea of the real nature of the works he will some day be called upon to plan. On the other hand, it is highly advisable that Indian Engineers of greater maturity should see far more of European practice (and particularly continental and American practice) than is now the case. Many of them do not belong to the institution of Civil Engineers or to any corporation which issues professional papers, most cannot afford even to take in English Engineering periodicals, and are therefore seriously hindered from advancing with the times. None certainly have money to spend in travelling to inspect important operations at home even, much less abroad.

A certain amount of mechanical knowledge and familiarity with field work and construction is essential to a student if he is to thoroughly comprehend the theory of his profession and to obtain a firm grasp of principles, and especially if he is to be of real use directly he leaves college. In this particular the course of study at Coopers Hill leaves, or used to leave, much to be desired. It seems to be forgotten that on entrance a general education, not a technical or a scientific education, is assumed and assumed rightly. It is the fact, but one which is not justly estimated by some of the instructors, that many students enter the college with a fair public school education but ignorant of the difference between a boiler and a cylinder, ignorant of natural science, often merely grounded in mathematics but no more. Nor are these likely to be by any means the worst Engineers for Indian purposes. It is, however, perfectly obvious that a youth's education should continue from the point at which he has arrived, and it is most injurious to leave out intervening steps and begin again on a higher rung of the ladder. Many Coopers Hill men are seriously crippled by this process, perhaps for life, certainly till practical experience, often too late and never completely, enables them to supply the gaps for themselves. Students in their first year should undoubtedly be divided into classes according to their previous knowledge of each subject and the instructors should subdue their spirit to the clay they work on. It is indeed a matter worth consideration whether some students should not complete the course in two years and others in four. It is, however, needless to enlarge on this subject. It hardly admits of controversy in point of principle, though differences of opinion would doubtedless arise in discussing means to meet the difficulty.

An almost equally obvious proposition is that practice should advance *pari passu* with theory, even if it should not precede it; and this is the other defect in the Coopers Hill curriculum. It has a considerable bearing on the immediate utility of Engineers on their arrival in India, so I do not apologise for alluding to it. In surveying alone does practice advance hand-in-hand

with theory at Coopers Hill. Omitting such subjects as pure mathematics (which however is only useful to an Engineer so far as it can be utilised) there is, or was, an almost absolute lack of practice to illustrate and impress the theoretical instruction. Students were supposed to learn the theory of steam without ever seeing the inside of a boiler or a cylinder, they drew and designed bridges but never saw a bridge being built, they studied the mathematics of pullies and blocks without a pulley within miles of them. It is hopeless to instruct an ignorant boy in the theory of heat or steam or mechanical movements or design of parts until he has seen engines pulled to pieces or in operation. The workshop has been, I believe, much improved of late and this is a step in the right direction. In my time it was not even obligatory to attend either the workshop or the chemical laboratory! But the college should have at least a respectable museum and a well-furnished model room; and they should be used. Every machine and every method of construction which is discussed in the earlier stages of the course should be shown in operation. The result would probably be to limit the subjects of discussion but this would be far from entirely detrimental. Such a mode of education is undeniably sound for any country and particularly for India. The Public Works Department is organised for the average man, and it is far more important that the average man should be competent from the start than that there should be a few brilliant officers, a good many who supply the defects in their education at the expense of their employer and a few who remain hopelessly befogged. Genius may be suffered to look after itself, and the training should be confined to the capacity of the majority of those for whom it is intended.

I have not touched upon the expense to India in the practical course at home, nor the expense to parents and consequent contraction in the number of recruits, nor on the inadvisability of leaving young men practically without direction or supervision. These are matters within every one's power to judge.

(Signed) A. T. MACKENZIE,
Ex. Engr., Chingleput Division.

Mount,
5th September 1896.

—

No. 112 W./C.

Forwarded.

(Signed) C. C. RAWSON, Lt.-Col., R.E.,
Suptg. Engineer, V Circle.

10th September 1896.

—

From F. J. WILSON, Esq., Executive Engineer, to the Chief Engineer, Public Works Department (through the Chief Engineer for Irrigation), dated Madras, 3rd September 1896.

With reference to your Memorandum, No. 1183 D., dated 28th August 1896, forwarding a copy of Government of India letter No. 1963 G., dated 5th August 1896, for opinion, I have the honour to say that I am strongly of opinion that the College course should be immediately followed by practical experience on works of some importance and magnitude and where all the latest methods are employed.

It is not always possible to post young Engineers from Coopers Hill to works of this class in India directly and I should be sorry to see the home practical course abolished altogether.

I would deprecate any step which would render it possible that a young Engineer from Coopers field should at a time when his enthusiasm and capability for learning are greatest, be sent without any experience whatever to routine work in an out-of-the-way place.

It is admitted in paragraph 5 of the letter from the Government of India that it is desirable that officers of the Public Works Department should acquaint themselves with English practice after a certain Indian experience, as they would then be in a position to adapt such practice to Indian requirements. But if this experience is to be put off till an officer goes home on furlough, this means waiting for eight years at least. I quite agree with the proposal to give every facility to officers on furlough studying works in England, but I think this can be considered quite apart from the question of a practical course immediately following the College course.

I believe that if a passed student from Coopers Hill makes a proper use of his time on a large work in England, that he will gain much useful knowledge which he can adapt to Indian requirements after he reaches India.

I would not lay down any hard-and-fast rule on the subject. On the whole, I am in favour of a practical course in England, but if there are suitable works going on in the province to which he is posted, the young Engineer might be sent out direct.

No. 38 W.

Forwarded.

(Signed) R. R. E. DRAKE-BROCKMAN, Col., R.E.,
Chief Engineer for Irrigation.

8th Sept. 1896.

From W. B. deWINTON, Esq., Superintending Engineer, III Circle, Bellary, to the Chief Engineer, Public Works Department, dated 14th September 1896, No. 1740 W.

In reply to your Memorandum No. 1183 D., dated 28th August 1896, I have the honour to say that the practice of detaining passed students of Coopers Hill College for a year's practical course in England, after they have completed their College course, may, in my opinion, be certainly abandoned with advantage, for the men would be far better employed out here.

2. I would not even permit specially-selected students to undergo a course of workshop practice in England, after completion of their College course, not because I do not think such knowledge necessary, for I believe it to be of the very first importance, but because I would make it part and parcel of the College course.

3. What Coopers Hill wants is a set of thoroughly equipped workshops for masons and bricklayers, carpenters, smiths and foundry men, through which in turn every Coopers Hill student should be compelled to pass, and learn with his own hands the rudiments of each craft. I would make this course of supreme importance, to the exclusion of other subjects which now find a place in the syllabus and are of little practical value. A Coopers Hill student now arrives in the country with a good general education, a smattering of surveying and levelling, and a complete ignorance of everything else connected with his future work. He has consequently to sit at the feet of a native maistry to learn the practical methods of laying out and building the simplest structures. Whereas, if the instruction above described was given to him at Coopers Hill in a thorough manner, he would be in the position of instructor instead of pupil, and could teach the vastly superior class of work prevalent in England to our artificers out here, and thus be a gain to the department from the very commencement of his service.

4. If this course is not practicable, I would give *every* passed student a year's practical training in England in workshop practice, whether he has a special aptitude that way or not, because his value to the department is thereby doubled, but this course would be more expensive to the State and not nearly so fruitful of good results as the proposal made in paragraph 3.

5. I quite agree with the proposal made in paragraph 5 of letter No. 1963 G. from the Government of India.

PRÉCIS.

Opinions of selected officers as to the necessity of a practical course in England for Coopers Hill Engineers.

1. *Mr. Malet.*—(*a*) Knowledge gained during practical course not commensurate with time spent, and cost to the State.

(*b*) If practical course in England be abolished, practical course in India should not be substituted.

(*c*) Special facilities should be afforded to officers on furlough to study works in England and elsewhere.

(*d*) Paying an officer bare expenses while inspecting is not sufficient; an honorarium should be given for the notes written about the works inspected, and these notes should be examined and passed by a senior officer on furlough.

2. *Mr. O'Connell.*—(*a*) The practical course in England should be abandoned, at any rate in the case of students intended to be employed in the Irrigation department.

3. *Mr. De Morgan.*—(*a*) The practical course in England serves no useful purpose.

(*b*) Practical course in India for a year, or even more, may be substituted.

(*c*) Special concessions should be made and ample facilities offered to enable selected officers on furlough to study works in England and elsewhere.

(*d*) A course of workshop practice in England is unnecessary.

4. *Mr. Mackenzie.*—(*a*) Students with a pronounced mechanical bent may be permitted to undergo a course of workshop practice in England, and that for two years, one year being not long enough.

(*b*) As regards other students, practical course in England is unnecessary.

(*c*) It is desirable that Indian Engineers of some experience should see far more of European practice, particularly of continental and American practice, than is now the case.

5. *Mr. F. J. Wilson.*—(*a*) The home practical course should not be abolished, unless there are suitable works in India, to which to post a young Engineer on arrival from England.

(*b*) Every facility should be given to officers on furlough to study works in England.

6. *Mr. de Winton.*—(*a*) Practical course in England may be abandoned with advantage.

(*b*) *Every* passed student may have a year's practical training in England in workshop practice, unless a course of workshop practice can be made part and parcel of the College course to the exclusion of subjects which now find a place in the syllabus, and are of little practical value.

(*c*) Every facility should be given to officers on furlough to enable them to acquaint themselves with English practice.

Note by the Chief Engineer, Public Works Department.

The opinions of six selected Engineers have been taken with reference to Government of India No. 1963 G., dated 5th August 1896, and a précis of these opinions is herewith forwarded; and it will be noticed that five out of the six officers are in favour of the practical course being abolished. All agree that every facility should be given to officers on furlough to inspect works. One is of opinion that students with a pronounced mechanical bent may be permitted to go through a course of workshop practice for two years, another is of opinion that *every* student should have a year's practical training in England in workshops.

2. I agree with the majority in thinking that the knowledge gained by the practical course is not commensurate with the time spent thereon and the attendant expense to the State, but at the same time I am inclined to think that students with a natural bent for the following subjects should be permitted to go through a course in England, as they cannot gain proper experience in this country:—

Mechanical Engineering.
Electrical Engineering.
Architecture.

It would probably be sufficient if one student in each batch was selected for instruction in each of these subjects; this would mean that three students would go through a practical course each year and that would not be much expense to the State.

3. I consider it would be useless to substitute a practical course in India for the one in England, at the same time I think that officers should be allowed many more opportunities for inspecting works in India than at present. It is seldom that, at any time, there are not several works of considerable magnitude in progress in different parts of India and I consider that, whenever possible, selected officers should be allowed to visit these works and report on them, all their expenses being paid by the State. There have been many large works carried out in India during the last twenty years, but I know of no case of an officer being allowed to improve his engineering knowledge by inspecting works outside his own province at the expense of the State.

4. I agree with the general opinion of the officers consulted that every facility should be given to officers on furlough to study engineering works at Home and to induce officers to do so I think the terms should be more liberal than at present, and I agree with Mr. Malet that paying an officer his bare expenses is not sufficient and that an honorarium should be given for the inspection notes according to their value. I have never yet known an officer who had inspected works at Home, who did not say that he had been much out of pocket by doing so. What I propose is therefore that—

First.—The present practical course be abolished.

Second.—That certain selected students go through a practical course of two years in—

Mechanical Engineering.
Electrical Engineering.
Architectural Engineering.

Third.—That every facility should be allowed to officers in this country to inspect large works in progress in all parts of India, their expenses being paid by the State.

Fourth.—That every facility should be allowed to officers to inspect works in England, America and on the continent while on furlough and that they should be granted an honorarium on their inspection notes according to their value.

5. I am not aware how much the present practical course costs the State, but I think it probable that if it be abolished, the saving effected would cover the cost of the above proposals.

21st Oct. 1896. (Signed) D. McNEIL CAMPBELL, Colonel, R.E.,
Chief Engineer.

ORDER—No. 3035 W., dated 26th October 1896.

His Excellency the Governor in Council sees no reason to differ from the conclusions arrived at by the Chief Engineer, and the Government of India will be informed accordingly.

[Here enter No. 3036 W., dated 26th October 1896.]

(True Extract.)

Under Secretary to Government.

To the Chief Engineer for Irrigation.
,, the Consulting Engineer for Railways.
,, Superintending Engineers.
,, the Consulting Architect to Government.
,, the Examiner, Public Works Accounts.

Exd. Md. Pahilvan.

Public Works (1896.) Department.

CURRENT No. 7894

(1½)

Order

From Govt. of India

No. 1963 G.

Dated Aug: 5th

Received " 20th

Enclosures —

Spare copies 12.

SUBJECT.

Practical course.

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Requesting an expression of opinion of any selected officers regarding the proposal to abolish the — in England of passed students of Coopers Hill College.

O.335

[P. W. 29 / 1,000—5-8-96.]

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

No. 1963 G.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

GENERAL.

To

THE SECRETARY TO THE GOVERNMENT OF MADRAS, PUBLIC WORKS DEPARTMENT.

THE SECRETARY TO THE GOVERNMENT OF BOMBAY, PUBLIC WORKS DEPARTMENT.

THE SECRETARIES TO THE GOVERNMENTS OF BENGAL, THE NORTH-WESTERN PROVINCES AND OUDH, AND THE PUNJAB, PUBLIC WORKS DEPARTMENT.

THE CHIEF COMMISSIONERS OF THE CENTRAL PROVINCES, BURMA AND ASSAM.

THE RESIDENT AT HYDERABAD.

THE DIRECTOR GENERAL OF RAILWAYS.

THE CONSULTING ENGINEER TO THE GOVERNMENT OF INDIA FOR RAILWAYS, ASSAM.

Simla, the 5th August 1896.

SIR,

I am directed to inform you that the Government of India have before them a suggestion that the practice of detaining passed students of the Coopers Hill College for a year's practical course in England, after they have completed their college course, should now be abandoned.

2. It is stated that the knowledge of engineering methods gained by these students during their practical course is not only incommensurate with the time spent thereon and with the attendant expense to the State, but also that such experience can as readily be acquired by the young engineer on works in India without any preliminary practical course in England.

3. It is not suggested that a practical course in India should take the place of a practical course in England, but simply that the latter should be abolished and that Coopers Hill Engineers should proceed to India and begin, on works there, to learn the practical side of their profession so soon as they have completed their College course at Coopers Hill.

4. A suggestion has also been made that selected passed students might be permitted to undergo a course of workshop practice in England, but that only those who may have exhibited a special aptitude for mechanical pursuits should be so selected and trained.

5. It is admitted that, after a certain experience of Indian Engineering has been acquired, it is desirable that officers of the Public Works Department should acquaint themselves with English practice, as they will then, with their Indian experience, be in a position to adapt such practice to Indian requirements.

The Government of India therefore hold that every facility and encouragement should be given to officers on furlough to study those works on which they would gain experience likely to be of use to them in the particular branch of engineering they may have adopted in India or for which they may have exhibited a natural aptitude.

6. Before coming to any decision regarding the proposal to abolish the practical course the Government of India desire to consult Local Governments and Administrations as to the results of their experience, and I am accordingly to request that with the permission of His Excellency the Governor in Council / His Honour the Lieutenant Governor / the Chief Commissioner they may be favoured with the opinion of the Local Government / Administration and of any selected officers whom the Local Government / the Local Administration / You may consult on the proposal.

I have the honour to be,

SIR,

Your most obedient Servant,

J M Birch

Col., R.E.,

Secretary to the Government of India.

G. C. Press, Simla.—No. 870 P. W. D.—7-8-96.—412

To

The Secretary to the Govt. of Madras

Public Works Department

Unt 1286

Public Works (1896) Department.

CURRENT No. 8630

(2)

Order

From

The Supg. Engineer
4th Circle.

No. 465/W

Dated 23rd September 1896

Received 28.9.96

Enclosures Nil

Spare copies 4

SUBJECT.

Students of the Coopers Hill College.

Submits Mr. Malet's opinion regarding the practical training of in England.

P. W. 19
1,000—5-8-96.

0.L.5449

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

P. W. 59
1,000—5-8-96.

No 3860
16.9.96

Camp. Pykara
16 September 1896

From
Mr A. A. G. Malet – E.P.

To
The Chief Engineer
& Joint Secretary to Government P.W.

No. 465/W d/23-9-96
Forwarded.
J. Hammer
Supdg Engineer, 4th Circle.

Sir

In reply to your No 1183 D d/- 28.8.96 I have the honor to report as follows.–

2. I am of opinion that the knowledge of Engineering methods gained by passed students of Coopers Hill College during their practical course in England is not commensurate with the time spent thereon & with the attendant expense to the State, but I do not think, as stated in para 2 of the Simla memorandum that the experience gained in England can be acquired as readily by the young engineer on works in India.

3. I am also of opinion that it would not be advisable to substitute a practical course in India if the practical course in England is abolished.–

4. I entirely concur with the remarks in para 5 of the Simla memorandum & consider that special facilities & inducements

s.L.S 426

inducements should be offered to Officers on furlough to study works in England, on the continent or elsewhere.

5. It is difficult to lay down a hard & fast opinion to cover the widely varying exigencies of the different branches of the service in this country but I feel sure, that in all branches, even including Sanitary Engineering, an officer could gain a great deal more knowledge in a given time if he studied works at home after some years practical work in this country, than as a student.

6. A young Engineer is not called on to design or be responsible for the carrying out of works when he first joins & the time when this responsibility falls on him is approximately coincident with his first furlough, if he can afford to take it.

7. An Officer should know how to handle ordinary tools when he comes out & this knowledge can be gained at Coopers Hill College.

8. The proportional cost of land, labour, materials & supervision is so different at home to what it is out here, that entirely different methods have to be adopted for ordinary work in the two countries. The student is unable to discriminate between what will be & what will not be useful to him out here & it follows, that the greater part of his time, during his practical course at home, is wasted –

It also follows that the methods employed in England cannot (except in special works) be acquired out here, but as these methods are not, as a rule, suitable for this country, this is immaterial.

PUBLIC WORKS

9. My remarks do not of course apply to very special branches such as Electrical Engineering, Mining, &c, these must be studied at home.

10. Whether the practical course at home is abolished or not, I am sure it would be in the interests of Government if special encouragement was offered to induce Officers to study works whilst on furlough.

The present practice of paying actual expenses, if notes are sent in, is not sufficient.

Notes must of course be insisted on, but, in addition to actual expenses, a small honorarium should be offered if the notes are passed & a larger honorarium, up to a certain limit, if the notes are considered decidedly useful & show that considerable time & pains have been devoted to collecting the knowledge embodied in them.

The notes could be examined & the honorarium recommended by any senior Officer on furlough, who applied for & was considered fit for the work, in the same way as a senior Officer is now appointed to supervise the students of Coopers Hill College during their practical course.

11. I venture to make the remarks contained in the last para from my personal experience. When on furlough in 1890 I received permission & assistance from the India Office to visit several works.

I took rough notes, but the prospect of bare actual expenses was not

Sufficient to make me spare the time & take the trouble of putting them into suitable form for submission to the India Office.

I have the honor to be
Sir
Your most Obedt: Servant

Allan C. Walker

Through the Superintending Engineer
IV Circle –

Public Works (1896) Department.

CURRENT No. 8401

(3) 5½

Order

From
The Supg. Engineer,
Fourth Circle.

No. 453/W

Dated 15th September 1896
Received 19.9.96
Enclosures Nil
Spare copies –

SUBJECT.

Students of the Coopers Hill College.

Forwards opinion of the Ex: Engineer, Salem Division regarding the — undergoing practical Course at home.

[P. W. 19 / 1,000—5-8-96.]

o.L.S 426

22/5/96.

BACK PA

the time & take

G.O.	No.	Department.	Date.

G.O.	No.	Department.	Date.

Executive Engineer's Office, Salem Division,
10"/11 September 1896.

No. 331/S.E.

From
H. W. O'Connell Esqr
Executive Engineer,
Salem Division.

To
The Superintending Engineer
IV Circle.

Sir,

Enclosures.

+ sent in original

With reference to Chief Engineer's Memorandum No 1183 D dated 28" August 96. I am of opinion that the socalled practical course now gone through by Cooper's Hill students is as a rule of very little use in fitting them for the work they have to do out here. It may be of use to those employed in the Railway Department but of little or no use to those employed in the Irrigation Department. The sooner men destined for the Irrigation Department come out, the sooner will they become useful members of the Irrigation Department of the P.W.D.

I therefore am of opinion that as far as concerns the Irrigation Department the practical course at home should be abandoned.

I have the honor to be
Sir,
Your most obedient Servant.

Hask. O: Cunnell
Executive Engineer

No 453/W d/15-9-96

Cm
7/9 -

Forwarded to the Chief Engineer P.W.D. with reference to his No 1183 D. dated 28th August 1896.

Supg. Engr 4th Circle.

Public Works (1896) Department.

CURRENT No. 8416

1 Copy

(4) 1

6½

Order

From J. C. Larminie Esq.
Superintending Engineer I.C.
To The Chief Engineer, P.W.D.

No. 444 G.L.

Dated 12th September 1896
Received 19.9.96
Enclosures -
Spare copies -

SUBJECT.

Practical Course of Cooper's Hill College Students — Forwards letter from W.C. De Morgan Esq. Ex. Engr reporting on the —

Compile. 22/9/96

C1095

22/9/96 DW

P. W. 19
1,000—5-8-96.

O.L.S. 426

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

No 444 G.L.

Forwarded in original to the Chief Engineer R.o.g with reference to his No $\frac{1183 D}{28.8.96}$

J C Lar[illegible]
Superd Engr
1st Circle
12/9/96

Despd. 15-9-96

Ganjam Division Office, Berhampur.

1896.

14 SEP 96

No. 2948

From

W. De Morgan Esqre.
Executive Engineer,
Ganjam Division.

68

To

The Superintending Engineer I Circle

Dated Janamilli 8 Septr 1896.
Despatched —— 11 —— do
Received
Enclo.

Sir,

With reference to your No. $\frac{413 GL}{3.9.96}$ on Chief Engineer's No $\frac{1183}{28.8.96}$, I have the honor to inform you that as far as my personal experience is concerned the so called "practical course" before leaving Coopers Hill, served no useful purpose.

2. As far as I can recollect the future career in India of the passed student -

student received no consideration, and a man who was ultimately posted to the Bengal irrigation system was very probably sent to Crewe workshops, while another who in India subsequently connected himself with Railway enterprise might have received his practical training on a system of Municipal waterworks. I recollect that my practical course was on a newly opened line of Railway. I have never had anything to do with Railways subsequently, in or out of India.

3. I do not deny that the mental and professional capabilities of a student may be materially improved by a course of practical training in any branch of Engineering science, and doubtless if during his course he really take every advantage of his opportunities, he will feel the benefit in after life. Of course, the curriculum at Coopers Hill has greatly changed since I was there; but in my time as far as I can recollect, it was only very exceptional student who were in a frame of mind to reap much benefit from any practical course, so long as they secured their appointments.

4. In my opinion it would be far better to despatch your neophyte directly he has passed out of Coopers Hill straight to India,

and put him on a practical course extending to a year or even more, in the particular branch of the Department in which he is to serve. If he is to belong to the Irrigation branch, he should see as many of the best types of work construction and work maintenance; in the North and South of India; If he is to be attached to Railways he should have the opportunity of obtaining some insight into Survey, Construction and management of open lines of Railway.

5. But after his branch has been decided on, his practical course should be regidly limited to that branch. Ordinary Engineering and mechanical details are the same for all branches, and a man will measure up earthwork as well for a Canal, as a railway embankment.

6. After a student has had five or six years work in India he will have shown what stuff there is in him; and it is then, as I take it time enough to give him a chance of gaining extended practical experience. He will now have gained if he has used his opportunities, some idea of how Engineering projects are worked, and will probably fondly imagine that India possesses all the Engineering knowledge in

the world – particularly as regards "Irrigation". Now is the time to enlarge his mind and introduce new ideas. His furlough approaches; so let every facility be afforded for inspecting the irrigation systems of Western Countries – the River systems of Italy, the reservoirs of France, and the huge water supply arrangements in Great Britain. If he belongs to the Railway, in any of the three branches, (Survey, Construction, or open line), I would suggest give him every facility for making himself acquainted with American Engineers, their advanced ideas and – rapid methods of Construction;

and

and I most cordially agree with para 5 of the G.O. $\frac{1963\ G}{5\text{-}8\text{-}96}$, in which it is suggested that every facility should be given to officers on furlough to study works on which they may gain experience in their particular branch of Engineering – in England and in foreign Countries.

7. And I further think that ~~any~~ very particular concessions should be made, and ~~any~~ ample facilities offered to enable such officers to make the best use of their opportunity, but at the same time, I would point out that – such concessions and opportunities should not be granted to

every Coopers Hill student who has completed a particular time of service, but only to such as have proved themselves good servants to Government. It is unfortunate to be obliged to remark that the suggestions I have offered might lead to grave abuse of Government interests; but like many other similar cases, rules can do no good, and the principle of competent selection is all important. It is hardly necessary for me to suggest a recent instance, in connection with Coast lighting; which as far as I can judge will bear ~~more~~ most valuable fruit.

8. As regards para 4. I have no experience in workshop practice; Generally ordinary

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Ordinary purposes are served by a very low standard of skill - in fact the ordinary Smith maistry, combined with some place where screws may be turned, will do all that is wanted. Moreover there are so many well appointed firms in Madras, Bombay, & Calcutta that special mechanical aptitude for purely Govt. workshops appears to me unnecessary.

I have the honor to be
Sir,
Yours most obedt Servt
W DeMorgan 8/9
Of Executive Engineer

Public Works (1896) Department.

CURRENT No. 8209

(5) 112

Order

From The Supg. Engineer
5th Circle

No. 112 R / C

Dated 10. 9. 96
Received 11. 9. 96
Enclosures 1 2
Spare copies -

SUBJECT.

Note on Course of Instruction at Cooper's Hill —

Forwards —

by Mr. A. T. Mackenzie, Executive Engineer —

Compile 18/9/96

Cur 18/9/96. DW/W

P.W. 29
1,000—5-8-96.

0. L. S. 414

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

SUPERINTENDING ENGINEER'S OFFICE,
No. 434 C.N.
9 - SEP. 1896
V. CIRCLE, P.W.D., MADRAS.

11P

118

From
The Executive Engineer
Chingleput division

To,
The Chief Engineer
Public Works Department

Thro'
The Superintending Engineer
V Circle

Dated 7th
Despd. "
Received "
} September 1896.

Enclo: 1

No. 1784

Note on Course of Instruction at Coopers Hill.

Forwards —— by Sd/-
A. T. MacKenzie. Executive Engineer.

No 112W/C
Forwarded.

10. 9. 96
Lt Colonel R.E.
Superintending Engineer 5th Circle

No. 1784

P. W. D.

CHINGLEPUT DIVISION OFFICE,

Camp,

7th September 1896.

From

A. T. Mackenzie Esqre
EXECUTIVE ENGINEER,
CHINGLEPUT DIVISION.

128

To

THE Chief Engineer
Public Works Department.
Thro' The Superintending Engineer
V Circle

Sir,

Enclosures.
1. note.

In reply to your memo No 1183 D of 28th August 1896, I have the honour to enclose a short note embodying some of the views which have been impressed on me in India concerning the practical course prescribed ~~for~~ students after leaving Coopers Hill.

I have the honour to be
Sir,
Your most obedt servt
A T Mackenzie
Executive Engineer,
Chingleput Division

7-9-96

Note on Course of Instruction at Coopers Hill.

As a general statement it may be said that students at Coopers Hill are divided into two classes, those with a pronounced mechanical bent & those with more aptitude for civil engineering. The scope for the former in India is extremely limited & it is obvious that in the interests of India a few only should receive extraordinary education in that direction. For this purpose India cannot be said to be the best or even a good school. Knowledge is gained by trial & error, a costly process, & the ultimate acquirement is often of a desultory nature, incomplete & unscientific, unaided by the traditions of English practice & by the competition which forms them. Such students should undoubtedly receive a practical training in England, & for this purpose one year is not long enough. It should be two years & it should be extensively varied. Such men again are wasted on the ordinary work of an Engineer in India. They should be kept if possible entirely for the duties to which they are best suited. Even if these duties were sometimes below their capacity the Government would be well repaid in economy & good management.

For the other class a practical course in England is in my opinion unnecessary. Work in India, taken as a whole, is very different from that in England in the manner of execution. Where an Engineer in England would use machinery one in India would use coolies, where one would use Portland Cement the other would

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have to be content to mix surki with his lime, where one can trust his clerk of works the other can trust no one, where one relies on a Contractor the other must be his own Contractor often & always his Contractor's Engineer; & so on. Instances might be indefinitely multiplied but the fact is too well known to need illustration. On this ground then it is evidently better that a young Engineer should gain his initial experience among the materials he will have to work with, & not among conditions very dissimilar; & if he is placed under reasonable supervision in a position of some responsibility he will acquire details more quickly & more thoroughly, & not be disheartened by the difference between English & Native labour &, still more, English & Native Subordinates. I do not wish to deny that in methods of execution there is much to be learnt at home. Methods in India now are very like those in vogue in England in the fifties, or forties, or earlier, but with the improvement of communications the possibilities of mechanical aid become vastly easier, & it is most necessary that officers should be acquainted with all improvements of value. But even in this the benefit is likely to be far greater when the officer is in a position to discriminate between what is & what is not likely to be useful. The value of English works however to an Indian Engineer lies more in design than in execution, & such matters a young man fresh from College is hardly in a position to comprehend, having no idea of the real nature of the works he will some day be called upon to plan. On the other have to be content to mix surki with his lime, where one can trust his clerk of works the other can trust no one, where one relies on a Contractor the other must be his own Contractor often & always his Contractor's Engineer; & so on. Instances might be indefinitely multiplied but the fact is too well known to need illustration. On this ground then it is evidently better that a young Engineer should gain his initial experience among the materials he will have to work with, & not among conditions very dissimilar; & if he is placed under reasonable supervision in a position of some responsibility he will acquire details more quickly & more thoroughly, & not be disheartened by the difference between English & Native labour &, still more, English & Native Subordinates. I do not wish to deny that in methods of execution there is much to be learnt at home. Methods in India now are very like those in vogue in England in the fifties, or forties, or earlier, but with the improvement of communications the possibilities of mechanical aid become vastly easier, & it is most necessary that officers should be acquainted with all improvements of value. But even in this the benefit is likely to be far greater when the officer is in a position to discriminate between what is & what is not likely to be useful. The value of English works however to an Indian Engineer lies more in design than in execution, & such matters a young man fresh from College is hardly in a position to comprehend, having no idea of the real nature of the works he will some day be called upon to plan. On the other hand it is highly advisable that Indian Engineers of greater maturity should see far more of ~~Conti~~ European practice (& particularly Continental & American practice) than is now the case. Many of them do not belong to the Institution of Civil Engineers or to any corporation which issues professional papers, most cannot afford even to take in English engineering periodicals, & are therefore seriously hindered from advancing with the times. None certainly have money to spend in travelling to inspect important operations at home even, much less abroad.

A certain amount of mechanical knowledge & familiarity with field work & construction is essential to a student if he is to thoroughly comprehend the theory of his profession & to obtain a firm grasp of principles, & especially if he is to be of real use directly he leaves College. In this particular the course of study at Coopers Hill leaves, or used to leave, much to be desired. It seems to be forgotten that on entrance a general education, not a technical or a scientific education, is assumed, & assumed rightly. It is the fact, but one which is not justly estimated by some of the instructors, that many students enter the College with a fair public school education but ignorant of the difference between a boiler & a cylinder, ignorant of natural science, often merely grounded in mathematics, but no more. Nor are these likely to be by any means the worst Engineers for Indian purposes. It is however perfectly obvious that a youth's education should continue from the point at which he has arrived, & it is most injurious to leave out intervening steps & begin again on a higher rung of the ladder. Many Coopers Hill men are seriously crippled by this process, perhaps for life, certainly till practical experience, often too late & never completely, enables them to supply the gaps for themselves. Students in their first year should undoubtedly be divided into classes according to their previous knowledge of each subject & the instructors should subdue their spirit to the clay they work on. It is indeed a matter worth consideration whether some students should not complete the course in two years & others in four. It is however needless to enlarge on this subject. It hardly admits of controversy in point of principle, though differences of opinion would doubtless arise in discussing means to meet the difficulty.

An almost equally obvious proposition is that practice should advance pari passu with theory, even if it should not precede it; & this is the other defect in the Coopers Hill curriculum. It has a considerable bearing on the immediate utility of Engineers on their arrival in India, so I do not apologise for alluding to it. In Surveying alone does practice advance hand in hand with theory at Coopers Hill. Omitting such subjects as Pure Mathematics (which however is only useful to an Engineer ~~in~~ so far as it can be utilised) there is, or was, an almost absolute lack of practice to illustrate & impress the theoretical instruction. Students were supposed to learn the theory of steam without ever seeing the inside of a boiler or a cylinder, they drew & designed bridges but never saw a bridge being built, they

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studied the mathematics of pullies & blocks without a pulley within miles of them. It is hopeless to instruct an ignorant boy in the theory of heat or steam or mechanical movements or design of parts until he has seen engines pulled to pieces or in operation. The Workshop has been, I believe, much improved of late & this is a step in the right direction. In my time it was not even obligatory to attend either the workshop or the Chemical Laboratory! But the College should have at least a respectable museum & a well-furnished model room; and they should be used. Every machine & every method of construction which is discussed in the earlier stages of the Course should be shown in operation. The result would probably be to limit the subjects of discussion but this would be far from entirely detrimental. Such a mode of education is undeniably sound for any country & particularly for India. The Public Works Department is organised for the average man, & it is far more important that the average man should be competent from the start than that there should be a few brilliant officers, a good many who supply the defects in their education at the expense of their employer, & a few who remain hopelessly befogged. Genius may be suffered to look after itself, & the training should be confined to the capacity of the majority of those for whom it is intended.

I have not touched upon the expense to India in the practical course at home, nor the expense to parents & consequent contraction in the number of recruits, nor on the inadvisability of leaving young men practically without direction or supervision. These are matters within everyone's power to judge.

Incomt ——}
5th Septr. 1903.

A R Mackenzie
Exec: Engineer, Ch Dn

OWE 2
8209/56

Public Works (1896) Department.

CURRENT No. 8139

(6) 18½

Order

From The Chief Engineer for Irrigation

No. 38-W.

Dated 8th Sept. 1896

Received 9. 9. 96

Enclosures -

Spare copies -

SUBJECT.

Forwarding letter from Mr Wilson protesting against the proposal to abolish altogether the Practical Course of passed students of the Coopers Hill College in England

Compiled 15/8/96

Comps 15/8/96 DW

~~DC~~ /10

O.L.S. 396

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

18

E. I. Form No. 3 (*a*).
00-8-11-95.

No.

Office of the Chief Engineer for Irrigation,
Madras, 3rd September 1896.

From

F.J.Wilson Esquire
Executive Engineer

Through

The CHIEF ENGINEER FOR IRRIGATION,

180

To

The Chief Engineer and Joint Secretary to
Government, P.W.D.

Enclosures.

Sir,

With reference to your Memo NO:1183.D.dated 28th Aug: 1896 forwarding a copy of Government of India letter NO:1963.G.dated 5th August 1896 for opinion, I have the honour to say that I am strongly of opinion that the college course should be immediately followed by practical experience on works of some importance and magnitude and where all the latest methods are employed.

It is not always possible to post young Engineers from Coopers Hill to works of this class in India directly and I should be sorry to see the home practical course abolished altogether.

I would deprecate any step which would render it possible that a young Engineer from Coopers Hill should at a time when his enthusiasm and capability for learning are greatest, be sent without any experience whatever to routine work in an out of the way place.

[It is admitted in para 5 of the letter from the Government of India that it is desirable that officers of the P.W.D. should acquaint themselves with English practice after a certain Indin experience, as they would then be in a position to adapt such practice to Indian requirements. But if this experience is to be put off till an officer goes home on furlough this means waiting for eight years at least. I quite agree with the proposal to give every facility to officers on furlough studying works in England but I think this can be considered quite apart from the question of a practical course immediately following the college course.

189 .

From

THE CHIEF ENGINEER FOR IRRIGATION,

To

THE

The Supdg Engineer,
III Circle,
Bellary

No.

Dated

Despatched

Received

ENCLOSURES.

Subject.

Passed students of
Coopers Hill College
Making certain suggestions
regarding the practical

I believe that if a passed student from Coopers Hill makes a proper use of his time on a large work in England that he will gain much useful knowledge which he can adapt to Indian requirements after he reaches India.

I would not lay down any hard and fast rule on the subject. On the whole I am in favour of a practical course in England but if there are suitable works going on in the province to which he is posted the young Engineer might be sent out direct.

I have the honour to be

Sir

Your most obedient servant

Executive Engineer, P.W.D.

No. 38-W. dated 8th Septr/96

Forwarded

Rudrala-Bruhman

Colonel RE
Chief Engineer for Irrigation

48

Public Works (1896) Department.

CURRENT No. 8492

(7)

Regd 4-9-96

19½

Order

From The Supdg: Engineer,
III Circle,
Bellary

No. 1740.W

Dated 6th September 1896.

Received 16

Enclosures

Spare copies

SUBJECT.

Passed students of Coopers Hill College – Making certain suggestions regarding the practical training of the –

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18/9/96

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7.9.96 DW/W

OS 403/B

P. W. 29
1,000–5-8-96.

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

191

No. 1740 W.

Supdg: Engr's Office, III Circle,
Bellary, 14th September 1896.

From
W. B. deWinton Esqr.
Supdg: Engineer, III Circle,
Bellary.

To
The Chief Engineer,
P. W. Department,
Ootacamund.

Sir,

In reply to your Memo No. 1183 D. dated 28th August 1896, I have the honour to say that the practice of detaining passed students of Cooper's Hill College for a year's practical course in England, after they have completed their College course, may, in my opinion, be certainly abandoned with advantage, for the men would be far better employed out here.

2. I would not even permit specially selected students to undergo a course of Workshop practice in England, after completion of their College course, not because I do not think such knowledge necessary, for I believe it to be of the very first importance, but because I would make it part and parcel of the College Course.

3. What Cooper's Hill wants is a set of thoroughly equipped Workshops, for masons

and bricklayers, carpenters, smiths and foundry men, through which in turn, every Cooper's Hill student should be compelled to pass, and learn with his own hands the rudiments of each craft. I would make this course of supreme importance, to the exclusion of other subjects which now find a place in the syllabus and are of little practical value. A Cooper's Hill student now arrives in the Country with a good general education, a smattering of surveying & levelling, and a complete ignorance of every thing else connected with his future work. He has consequently to sit at the feet of a native maistry to learn the practical methods of laying out and building the simplest structures. Whereas, if the instruction above described was given to him at Cooper's Hill in a thorough manner, he would be in the position of instructor instead of pupil, and could teach the vastly superior class of work prevalent in England to our artificers out here, and thus be a gain to the Department from the very commencement of his service.

4. If this course is not practicable, I would give every passed student a year's practical training in England in Workshop practice, whether he has a special aptitude that way or not, because his value to the Dept.

Department is thereby doubled, but this course would be more expensive to the State and not nearly so fruitful of good results as the proposal made in Para 3.

5. I quite agree with the proposal made in Para 5 of letter No. 1963 G. from the Government of India.

I have the honor to be,
Sir,
Your most obedient servant,

Supdg: Engineer, III Circle.
&c.
8/7/96.

Opinions of selected officers as to the Necessity of a practical Course in England for Cooper's Hill Engineers

(8)

1. Mr. Maleh — (a) Knowledge gained during practical Course not commensurate with time spent, and Cost to the State

(b) If practical Course in England be abolished, practical Course in India should not be substituted.

(c) Special facilities should be afforded to officers on furlough to study works in England and elsewhere.

(d) Paying an officer bare expenses while inspecting, is not sufficient; an honorarium should be given for the notes written about the works inspected, and these notes should be examined and passed by a senior officer on furlough.

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2. Mr. O'Connell — (a) The practical Course in England should be abandoned, at any rate in the case of students intended to be employed in the Irrigation Department

/P.T.O

3. Mr. De Morgan — (a) The practical Course in England. serves no useful purpose

(b) Practical Course in India for a year, or even more, may be substituted.

(c) Special Concessions should be made and ample facilities offered to enable selected officers on furlough to study works in England and elsewhere

(d) A Course of workshop practice in England is unnecessary.

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4. Mr. Mackenzie — (a) Students with a pronounced mechanical bent may be permitted to undergo a Course of workshop practice in England, and that for 2 years, one year being not long enough

(b) As regards other students, practical Course in England is unnecessary

(c) It is desirable that Indian Engineers of some experience should see far more of European practice, particularly of Continental and American practice, than is now the case.

5. Mr. J. J. Wilson — (a) The Home practical Course should not be abolished, unless there are suitable works in India, to which to post ~~a~~ young Engineer on arrival from England.

(b) Every facility should be given to officers on furlough to study works in England

---

6. Mr. de Winton — (a) Practical Course in England may be abandoned with advantage

(b) Every passed Student may have a year's practical training in England in Workshop practice, unless a Course of workshop practice can be made part and parcel of the College Course to the Exclusion of subjects which now find a place in the Syllabus, and are of little practical value

(c) Every facility should be given to officers on furlough to enable them to acquaint themselves with English practice

9

Public Works Department.

Note. by the Chief Engineer

The opinions of 6 selected Engineers have been taken with reference to Government of India No. 1963 G., dated 5th August 1896, and a precis of these opinions is herewith forwarded; and it will be noticed that 5 out of the 6 officers are in favour of the practical course being abolished. All agree that every facility should be given to officers on furlough to inspect works. One is of opinion that students with a pronounced mechanical bent may be permitted to go through a course of workshop practice for 2 years, another is of opinion that every student should have a year's practical ~~im~~ training in England in workshops.

I see no reason to differ from these conclusions.
A.S.H
22.10.96

2. I agree with the majority in thinking that the knowledge gained by the practical course is not commensurate with the time spent thereon and the attendant expense to the State, but at the same time I am inclined to think that students with a natural bent for the following subjects should be permitted to go through a course in England, as they cannot gain proper experience in this

coutry:-

Mechanical Engineering.

Electrical Engineering.

Architecture.

It would probably be sufficient if one student in each batch was selected for instruction in each of these subjects; this would mean that three students would go through a pratical course each year and that would not be much expense to the State.

3. I consider it would be useless to substitute a practical course in India for the one in England, at the same time I think that officers should be allowed many more opportunities for inspecting works in India than ~~they are~~ at present. It is seldom that, at any time, there are not several works of considerable magnitude in progress in different parts of India and I consider that, whenever possible, selected officers should be allowed to visit these works and report on them, all their expenses being paid by the State. There have been many large works carried out in India during the last 20 years but I know of no case of an officer being allowed to improve his Engineering knowledge by inspecting works outside his own province ~~them~~ at the expense of the State.

4. I agree with the general opinion of

Public Works Department.

Note. ~~By the Chief Engineer~~

The opinions of 6 selected Engineers have been taken with reference to Governmant of India No. 1963 G., dated 5th August 1896, and a precis of these opinions is herewith forwarded; and it will be noticed that 5 out of the 6 officers are in favour of the practical course being abolished. All agree that every facility should be given to officers on furlough to inspect works. One is of opinion that students with a pronounced mechanical bent may be permitted to go through a course of workshop practice for 2 years, another is of opinion that every student should have a year's practical ~~im~~ training in England in workshops.

I see no reason to differ from these conclusions.
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22.10.96

2. I agree with the majority in thinking that the knowledge gained by the practical course is not commensurate with the time spent thereon and the attendant expense to the State, but at the same time I am inclined to think that students with a natural bent for the following subjects should be permitted to go through a course in England, as they cannot gain proper experience in

this

of the officers consulted that every facility should be given to officers on furlough to study Engineering works at Home and to induce officers to do so I think the terms should be more liberal than at present, and I agree with Mr. Malet that paying an officer his bare expenses is not sufficient and that an honorarium should be given for the inspection notes according to their value. I have never yet known an officer who had inspected works at Home ~~that~~ who did not say that he had been much out of pocket by doing so. What I propose is therefore that

1st. The present practical course be abolished.

2nd. That certain selected students go through a practical course of 2 years in
    Mechanical Engineering.
    Electrical Engineering.
    Architectural Engineering.

3rd. That every facility should be allowed to officers in this country to inspect large works in progress in all parts of India their expenses being paid by the State.

4th. That every facility should be allowed to officers to inspect works in England, America~~n~~ and on the Continent while on furlough and that they should be granted an honorarium on their inspection notes according to their value.

5. I am not aware how much the present practical course costs the State, but I think it probable that if it ~~is~~ be abolished, the saving effected would cover the cost of the above proposals.

21/10/86

H.S. 21/10 R 24/10.

W

Submitted with reference to the Hon's note —

The orig. G.O. was not circulated to Hon's

Papers of a similar nature will in future be sent all round —

The Hon's note might perhaps be filed.

Ch

10.11.

Yes [illegible] 11/11/96

A/ [illegible] orders

[illegible]

Pub[illegible]ks Department.

No. 3035 – W. d/ 26th October 1896

PROCEEDINGS OF THE MADRAS GOVERNMENT.

25

Read the following

(1) From the Govt: of India, P.W.D. N.E. No. 1963. G d/ 5 August/96.
(4) do — S. E. I. Circle — " " 444 G. L. d/ 12 Septr/96.
(7) do — S. E. III Circle — " " 1740 W d/ 14 Septr/96.
(3) do — S. E. IV. Circle — " " 453/W d/ 15 Septr/96.
(2) do — S. E. IV. Circle — " — " 465/W d/ 23d Septr/96.
(5) do — S. E V. Circle — " — " 112.W d/ 10 Septr/96
(6) do — Chief Engr: for Irrgn. " — " 38.C.W d/ 8 Septr/96.
(8) Precis
Note by the Chief Engr: P.W.D " — " — d/ 21 Octr/96.

Papers to be printed
in the order shown.
Precis to precede
before Ch. Engr's note.
G. of I. letter to be
omitted in the copy of those
going to India

10

H.E. the Governor-in-Council sees no reason to differ from the conclusions arrived at by the Chief Engineer, and the Government of India will be informed accordingly.

Ch: Engr: for Irrgn: ✓
Cg: Engr: for Rys: ✓
Stg: Engrs: ✓
Cg: Archt: to Govt:
Exr: P.W. Accts:

Desptd 18/11/96

(H.E. No. 3036 W d/ 26th Octr/96)

To

The Secretary to the Govt: of India, P.W.D.

Sir,

With reference to your letter

40—300—3-3-96.

I quite agree with G.O. $\frac{3035\,W}{26.10.96}$, but I think that the papers relating to so important a matter of general interest shd. have been circd.

HWB
9/11/96

SAW

PUBLIC WORKS DEPARTMENT.

7 ORDERS FOR PERUSAL.

THE HON'BLE MR. H. W. BLISS, C.I.E.

CHEPÂK, 6 Nov. 1896.

A

Issue orders

Print soon

250

No 3035 - W. dt 26th October 1896

PROCEEDINGS OF THE MADRAS GOVERNMENT.

READ the following

(1) From the Govt: of India, P.W.D. N.E. No 1963. G d/ 5 August/96.
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(2) do — S. E. IV. Circle — " " $\frac{465}{W}$ d/ 23d Septr /96.
(5) do — S. E. V. Circle — " " $\frac{112.W}{C}$ d/ 10 Septr /96
(6) do — Chief Engr: for Irrgn. " " 38. W d/ 8 Septr /96.
(8) Precis
(5) Note by the Chief Engr: P.W.D. " " — d/ 21st Octr /96.

10

Papers to be printed in the order shown. Precis to be printed [illegible] before Govt. note. G.O. & letter to be omitted in the copy of those going to G. of India

H.E. the Governor-in-Council sees no reason to differ from the conclusions arrived at by the Chief Engineer, and the Government of India will be informed accordingly.

Ch: Engr: for Irgn: ✓
sg: Engr: for Rys: ✓
ntg: Engrs: ✓
sg: Archt: to Govt:
Exr: P.W. Accts:

Desvd 18/11/96

(H.E. No 3036 W d/ 26th Octr /96)

To

The Secretary to the
Govt: of India, P.W.D.

Sir,

With reference to your

letter No. 190[illegible] G. dated 6th August/96, I am directed to forward a copy of the Proceedings of this Govt: No. 3035 W d/ 26th October/96, embodying the opinions of six selected officers of the Madras P. W. Dept: on the proposal to abolish the year's practical course in England of successful students of the Coopers Hill College; also a precis of those opinions and a note on the subject by the Chief Engineer, - and to state that H.E. the Governor-in-Council sees no reason to differ from the conclusions arrived at by the Chief Engineer.

Recorded 7/11/96

I have &c.

26/10/96

W

Cu

26.10.96

The opinions of 6 [illegible] Examiners have been taken but in reference to [illegible] of them no [illegible] and a précis of their opinions is herewith forwarded; and it will be noticed that 5 out of the 6 appear in favor of the practical exam being abolished. All agree that every facility should be given to [illegible] to [illegible] [illegible]. One is of opinion that students with a [illegible] [illegible] the mechanical [illegible] may be permitted to go through a course of [illegible] practice for 2 years, another is of opinion that every student should have a year's practical training in Colleges or [illegible].

I agree with the majority in thinking that the practical exam the practical course is not commensurate with the time spent thereon & the attention devoted to the [illegible], but at the same time I am inclined to think that students with a natural bent for the following subjects should be permitted to go through a course in England as they cannot gain [illegible] [illegible] in this country

Mechanical Engineering
Electrical do
Architecture

It would probably be advisable if one student in each branch [illegible] [illegible] of instruction in each of these branches this would mean that three students one for three a practical course each year & these would not be much burden to the state

I ~~think~~ consider it would be excellent to substitute a practical course in India for the one in England, at the same time I think that officers should be allowed [illegible] more opportunities for visiting works in India than they are at present. It is seldom that at any time there are not several works of considerable magnitude

in Mysore in different parts of India &
Ceylon this; therefore I would submit whether
officers should be allowed to invest their
[illegible] & capital on them, as their [illegible]
being part of the estates. There have
been very large estates carried on
in India during the last 20 years but
I know of no case of an officer being
allowed to [illegible] his [illegible]
from working them ~~[illegible]~~ or the [illegible]
of the state.

I agree with the general opinion of the
Officers consulted that any facility
should be given to officers on furlough
to study engineering works at home
and to induce officers to do so I think
the leave should be made longer than
at present, and I agree with Mr Walter
that Sappers or officers who have experience
in such subjects and who are [illegible]
should be paid for the instruction [illegible]
according to their value. I have also seen

known an officer who has undertaken works at home that was not say that he has been much out of practice of doing so.

What I propose is therefore that

1st The present practical course be abolished

2nd That certain selected students, a three a practical course of 2 years in

Mechanical Engineering

Electrical Engineering

Architect~~ure~~ Engineering.

3rd That every facility should be given to officers in this country to undertake large works in progress in all parts of India their expenses being paid by the State.

4th That every facility should be given to officers to undertake works in Britain and on the Continent while on furlough & that they should be credited for in their respective rates according to their rates.

I am not aware how much the present practical course ~~[illegible]~~ costs the State but I think it probable that if it be abolished, the saving would effect even the cost of the above proposals.

20/10/88

The opinions of 6 selected Engineers have been taken with reference to the [illegible] of [illegible] as last and a précis of their opinions is herewith forwarded; and it will be noticed that 5 out of the 6 officers are in favour of the practical course being abolished. All agree that every facility should be given to officers on furlough to undertake works. One is of opinion that students with a pronounced bent for ~~the~~ mechanical engineering may be permitted to go through a course of workshop practice for 2 years, another is of opinion that only students should have a year's practical training in England in workshops.

I agree with the majority in thinking that the knowledge gained of the practical course is not commensurate with the time spent thereon & the allowances drawn & expense to the State, but at the same time I am inclined to think that students with a natural bent for the following subjects should be permitted to go through a course in Dublin as they cannot gain such instruction in this country

Mechanical [illegible]
Civil [illegible]
Architecture

It would probably be sufficient if one student in each branch [illegible] of instruction in each of these [illegible] that would mean that three students [illegible] in practical [illegible] & that would not be much addition to the state

I ~~think~~ consider it would be excellent to substitute a practical course in India for the one in Dublin, at the same time I think that officers should be allowed [illegible] ~~more~~ more opportunities for inspecting works in India than they are at present. It is [illegible] that at any time there are not [illegible] of [illegible]

I would like these general conditions as follows

Mr Mallet

1 Knowledge gained during practical course not communicated into [illegible] & [illegible] to the state

2 If practical course in Dublin be abolished practical course in India should not be substituted

3 Specimens of [illegible] should be offered to officers on furlough to study works in [illegible] & elsewhere.

4. That [illegible] an officer [illegible] & [illegible] should be [illegible] for the [illegible] & that these [illegible] should be examined & passed [illegible] on furlough.

Mr de Morgan

W

A precis submitted accordin

P. W. Department

Memo.

3035 3A 3W

No. 1183 D, d/ 28th August

Mr. W. B. de Winton
" W. C. De Morgan
" A. A. G. Malet
" H. H. O'Connell.
" F. J. Wilson
" A. T. Mackenzie

The undersigned ha the honour to circulate Government of India lett No. 1963 G, dated 5th August 1896, to the officers marginally noted, with a view to obtaining an opinion from Each.

3035-
30315

26/8/96

W

CWBR
26.8.96.

EAS

To

W. B. de Winton Esq., S.E. III
W. C. De Morgan Esq., S. E. I
A. A. G. Malet Esq, thro' S.E. IV
H. H. O'Connell Esq, thro' S.E. IV
F. J. Wilson Esq., thro E. I
A. T. Mackenzie Esq, thro' S.E. V

D/po 28/8/96

11883
2887

I would like the opinion of the following selected officers

Mr de Winton
Mr De Morgan
Mr Maler
Mr O'Connell
Mr J. J. Wilson
Mr A. T. Mackenzie.

26/8/86

The undersigned has the honour to circulate ~~G.O.~~ Govt of India letter No 19636, dated 5th August 1886, to the Officers marginally noted, with a view to obtaining an opinion from each.

CAWS
26.8.86.

HG
Seen & returned with thanks
12-11-86.

W.

1183
28.8.

It is stated in para 3 that "it is not suggested that a practical course in India should take the place of a practical course in England". But this is precisely what it does suggest, to all intents and purposes. If students for want of having underg practical course in England are sent to India to "learn the practical side of their profession" on works in this country, they are virtually students completing their Coopers Hill course. It would apparently be a great mistake to abolish the year's practical course under such circumstances. And it is quite certain that we should not get men capable of taking charge of works, of even minor importance, till they had been out a year.

8

P. W. Department

3035
3036

Memo.

No. 1183 D, d/28th August

Mr. W. B. de Winton
" W. C. De Morgan
" A. A. G. Malet
" H. H. O'Connell.
" F. J. Wilson
" A. T. Mackenzie

The undersigned has the honour to circulate Government of India letter No. 1963 G, dated 5th August 1896, to the officers marginally noted, with a view to obtaining an opinion from Each.

3035–
3036

26/8/96
W

CWBdeW
26. 8. 96.

To

W. B. de Winton Esq., S.E. III
W. C. De Morgan Esq., S.E. I
A. A. G. Malet Esq., thro' S.E. IV
H. H. O'Connell Esq., thro' S.E. IV
F. J. Wilson Esq., thro' E. I
A. T. Mackenzie Esq., thro' S.E. V

D/po 28/8/96

27

9/11