10 E.P.H. Dept.

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G.O. No. Ms. 1056 Edn.

dated 30.4.48

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O/m Rs

Ms 48 [illegible]

19

2B (2) Y/

Fort St. George,
19th April, 1948.

Dear Sir,

In the Interim Report of the Scientific Man Power Committee appointed by the Government of India, the Committee have suggested that the Degree Course may be reduced to three years, as a method of increasing the output of Engineering graduates. If we can substitute the three years course for the four years course, it will be possible for us to train one-fourth number of graduates more at the same cost. That means we will be able to train nearly 100 Engineers more every year. It will be a great saving for the Government. It will also accommodate a large number of boys who are anxious to get this training.

To consider this matter, I am summoning a Conference consisting of the following members:

1. Hon'ble Sri M.Bhakthavathsalam, Minister for Public Works.
2. Sri Dewan Bahadur N.Govindaraja Ayyangar, Chief Engr. (Special)
3. Sri Rao Bahadur C.Sundaram, Chief Engr. for Electricity.
4. Sri Rao Bahadur A.R.Venkata Acharya, Chief Engr., Irrigation.
5. Sri M.V.Subramanyam, Secretary, E. & P.H. Deptt.
6. Dr. K.J.Rudra, Principal, College of Engineering, Guindy.
7. Prof. A.Viswanath, Principal, Arthur Hope College of Technology, Coimbatore.
8. Dr. Sir A.Lakshmanaswami Mudaliar, Vice Chancellor, Madras University.

The Conference will be at 2.30 p.m. on the Wednesday the 28th April, 1948 in my room in the Secretariat. I shall be glad if you can kindly attend.

Despd
KRK
19/4

Yours sincerely,

T S Avinashilingam

To Members noted in the body of the letter.
Copy to Secy. E. & P.H.

3B

③ Edu and P.H. Dept

Issued to ad
Ave
30/4/48

Colleges - Eng: - Duration of course - Reduction
Committee to work out details - Appointed.

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Order (Edu) 1056 d. 30.4.48
MS

The Hon'ble Minister for Edu convened a ~~[illegible]~~ conference of the following gentlemen on 28.4.48 to consider the question of the duration of the Eng degree courses in this Province:—

1) Hon'ble Sri M. Bhakthavathsalam - H.M. (P.W.)
2) Sri Dewan Bahadur N. Govindaraja Ayyangar (C.E.) Special
3) Sri Rao Bahadur G. Sundaram ~~[illegible]~~ Chief Engr. (Electricity)
4) Sri Rao Bahadur A.R. Venkata Acharya Chief Engr (Irrigation)
5) ~~Sri~~ M.V. Subramanyan I.C.S. Secy, Edu and P.H. Dept
6) Dr. J.J. Rudra, Principal, College of Eng, Guindy
7) Prof. A. Viswanath, Principal, Arthur Hope College of Technology, Coimbatore
8) Dr. Sir A. Lakshmanaswami Mudaliar Vice-Chancellor, Madras University.

All members expressed their views on the matter and it was generally agreed that the period of the course may be ~~[illegible]~~ reduced to one of three years instead of the present

2

4 years without impairing efficiency. The Govt. have decided to constitute the following committee to work out the details in the matter :—

1) Sri Rao Bahadur. A. R. Venkatacharya
Chief Engr (Irrigation) – Chairman

2) Dr. G. J. Rudra, Principal, Principal, College of Eng, Guindy

3) Dr. ~~Sukumaran~~ Sukumaran, Prof of Electrical Eng. Guindy

4) Lt. Col. Paul, Prof of Mech. Eng, Guindy

5) Prof P. R. Ramaswamy, Prof of Civil Eng., A.H. College of Technology, Coimbatore

6) Sri Rao Bahadur G. Sundaram, Chief Engr for (Electricity)

7) Prof. A. Viswanath, Principal, A.H. College of Technology, Coimbatore – Secretary.

The meetings of the Committee will be held in Madras. The Chairman of the Committee is requested to forward the report to Govt within about 3 months.

Profs Viswanath and Ramaswamy will draw travelling and daily allowances admissible under the M.T.A. Rules.

jrm
29/4/48

29/4/48

29/4/48

To the Members of the Committee
Copy to the D.P.I.
Copy to PWD (E)
2 Spare copies

3B Notes 7

Please put up the Council papers for the reference of H. (Ed.) –

1, the interim report of the Technical Man-power Committee set up by the Govt. of India;

2, papers here when a proposal to reduce the course in the Engineering College from 4 yrs to 3 yrs was considered & decided on.

15/4/48.

(1) A copy of the report is placed below

(2) Attention is invited to pages 10-11, 21, 34, 93, 113 and 123 of

(A) 2

~~G.O.~~ 1829 Edn of 19.8.47

15/4/48 · 15/4/48

S

P: 93 (cf) & p: 123 (NF) [illegible] the proposal was deferred till recommendations in the Report were received from the [illegible] or the All-India Bd of Technical Edn.

15/4/48.

Hd (Edn)

15/4

This may be sent on the 28th instant.

SECRETARY, EDN. AND P. H. DEPT.
19 APR 1948
GOVERNMENT OF MADRAS

TSA
19.4.48

Please see under below

4B

Secretary, E. & P.H.

Please see herewith copy below of a D.O. letter to the Chief Engineers and others for summoning a Conference in the matter of substituting a three years course for Engineering instead of the present four. Any previous papers on the subject may be put up with a summarising note.

TSA
19-4-48

H.M. Education.

SECRETARY, EDN. AND P. H. DEPT.
19 APR 1948
GOVERNMENT OF MADRAS

At present the B.E Course is for four years. In 1946 the Govt appointed an Expert Committee to advise them on the question of opening new Eng colleges. The Committee made various recommendations and one of them was as follows:—

21 of G.O. No. 1829 Edn 19.8.47. (A)

I. That by intensive work and increasing the hours of work it is possible to provide basic degree courses in Civil Eng, Mech. Eng. and Electrical Eng. of three years duration instead of the present four years, without in anyway lowering the present standards

II. That the basic degree courses of three years duration should be the normal qualification for entry for Govt and public services

III. That the basic courses mentioned above should provide a wide choice of optional subjects in the third year, so as to prepare the necessary groundwork for such students as may desire to take any of the specialised post graduate courses.

IV. That specialised post graduate courses of study leading to a higher degree or diploma of one or two years duration according to the nature of the specialised courses should be organised in branches like Aeronautics, Highway Eng, Automotive Eng, Naval Architecture, Public Health Eng, Mining Eng &c.

The D.P.I stated that the universities would have to be consulted before any change could be made. Further he stated that it is only in England that the three years course existed; in America it is a four year course. Further the subject of Eng. has become so vast that a four year course as at present but with specialis[ed] practical work in colleges would be more advantageous to the country. The Govt asked the Director to consult the ~~[illegible]~~ universities. The Madras Univty did not agree for the following reasons:—

pp 10-11 of (A)

p 34 of (A)

p 93 of (A)

1) As the degrees conferred by it should conform to the standards which will be recognised all over India and some foreign ~~[illegible]~~ countries

2) that the bodies most competent to advise on this subject would be the Inter-Univty Board and the All-India Board of Technical Edn constituted by the Govt. of India

The Govt. agreed with the above view and the proposal was deferred till the recommendations of the Inter-Univty Board or the All India ~~[illegible]~~ Board of Tech. Edn were received

pp 113 & 123 of (A)

26/4/48

DM
26/4/48

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(6) 5B

The following members were present at the Conference:-

1. Hon'ble Sri M. Bhakthavathsalam - H.M. (P.W.)
2. Sri Dewan Bahadur N. Govindaraja Ayyangar, Chief Engineer, (Special)
3. Sri Rao Bahadur G. Sundaram, Chief Engineer for Electricity.
4. Sri Rao Bahadur A.R. Venkata Acharya, Chief Engineer (Irrigation).
5. Sri M.V. Subramanyam, Secretary, E.& P.H.
6. Dr. J.J. Rudra, Principal, College of Engineering, Guindy.
7. Prof. A. Viswanath, Principal, Arthur Hope College of Technology, Coimbatore.
8. Dr. Sir A. Lakshmanaswami Mudaliar, Vice Chancellor, Madras University.

All members experessed their views in the matter and it was generally agreed that the period of the course may be cut into one of three years instead of the present 4 years without impairing efficiency. To work out the details in the matter, the following Committee has been appointed:-

1. Sri Rao Bahadur A.R. Venkata Acharya, Chief Engineer (Irrigation) - Chairman.
2. Dr. J.J. Rudra, Principal, College of Engineering Guindy.
3. Dr. Sukumaran, College of Engineering, Guindy.
4. Col. Paul, -do- -do-.
5. Prof. P.R. Ramaswamy, Engineering College, Coimbatore.
6. Sri Rao Bahadur G. Sundaram, Chief Engineer for Electricity.
& 7. Prof. A. Viswanath, Principal, Engineering College Coimbatore - Secretary.

Except Prof. Viswanath and Prof. Ramaswami, all the others belong to Madras. The Committee meeting may be held in Madras and to those two ~~people~~ T.A. and D.A. for coming to the meeting may be allowed.

They may be requested to submit their report

12 6 CSR

within about 3 months so that we may have time to put it before the Technical Education Board and then before the University.

TSA
28-4-48

A draft order is subd.
P.W.D and Fin may see.

29/4/48.

29/4/48

SECRETARY, EDN. AND P. H. DEPT. 29 APR 1948 GOVERNMENT OF MADRAS

ASST. SECRETARY TO GOVERNMENT EDUCATION AND PUBLIC HEALTH DEPT. 30 APR 1948

E.P.H.u.o.30644A-1/48A
dated 29.4.48

PWD

2374 29.4.48

May be perused & passed on to Fin.

29 4 48

28/4 Fin

Pwns 23744/48
29.4.48

ASST. SECRETARY TO GOVERNMENT 33466 29 APR 1948 FINANCE DEPARTMENT

Fin (CSR)

The draft order below may be accepted
(All members of the Committee named on p. 2 of draft are officials).

29.4.48. 29/4/48.

30/4

E-PH.

Issue
30/4/48

Fin 33465 ESK-I
30-4-48
31393A

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(7) GB 13

DURATION OF ENGINEERING DEGREE COURSES IN THE UNIVERSITIES IN THE UNITED KINGDOM, U.S.A. & OTHER COUNTRIES.

Sl. No.	Name of country.	Name of University or College.		Remarks.
		3 years course.	4 years course.	
1.	United Kingdom	Aberdeen		
2.		Belfast.		
3.			Glasgow	Honours. course
4.		Edinburgh		
5.		St. Andrew.		
6.		Bristol.		
7.		Durham	Durham	4 years-Honours course.
8.		Leeds.		
9.		Manchester		
10.		Sheffield	Sheffield	do.
11.			Imperial College of Technology.	
12.				
13.	U.S.A.		Massechusetts Institute of Technology.	
14.			Carnegie inst., of Technology.	
15.		New York		
16.		Columbia.		
17.		California.		
18.	Canada	Alberta.		
19.		Manitoba.		
20.		Queens.		
21.	Australia	Adelaide.		
22.		Melbourne	Melbourne	4 years for Mech. & Elecl. Engg.
23.	~~Queensland.~~	Queensland		
24.	~~Sydney.~~	Sydney		
25.	~~Western Australia~~	Western Australia		

PTO

Sl. No.	Name of country.	Name of university or College.		Remarks.
		3 years course.	4 years course.	
26.	New Zealand		New Zealand.	
27.	South Africa	Cape Town. Rhodes.		

I. I have set to myself the following questions.--

(1) how best the engineering education in the Presidency can be improved;

(2) how practical training that the students get in the College workshops can be turned to good account;

and(3) how best can engineering students learn the intricacies in the designs of plant, machinery and various gadgets such as slide valve of a steam engine, the working of a 4 stroke and a 2 stroke diesel engine, equilibrium valve, air valve etc. of a watersupply main, inside details of bombs, air engine, dams, weirs etc.

II. To answer these three questions taking the first I find the following in the Bulletin of the M.I.T. under general information sub para "conduct".

> "Conduct"- "It is assumed that students come to the institute for a serious purpose and that they will cheerfully conform to such regulations as may be from time to time made by the faculty or administration."
>
> "Students are expected to behave with decorum and obey the regulations of the institute and to pay due respect to its officers".

I hold the view - I shall be only too glad to be told that it is wrong - that the Engineering College students especially of Madras have become more freedom minded and discipline has suffered. Students pay their fees often hard earned by their parents and strikes should therefore be entirely alien to the student population. Every strike among students means that the students are throwing away some of the hard earned money provied by their parents. The following sentence is also taken from the M.I.T.Bulletin.

> "It is the aim of the faculty to administer the discipline of the school so as to maintain the highest standard of integrity. The attempt of any student to present as his own the work of another or any work which he has not honestly performed or to pass any examination by improper means is regarded by faculty as a most serious offence and renders the offender liable to immediate expulsion. The aiding or abbetting of a student in any dishonesty is also held to be a grave breach of discipline."

publications and books and hav~~ing~~e been denied the facility to co-ordinate theory and practice by recourse to research we have developedundue respect towards printed matter and have often ben tardy not to admit ~~of~~ our ignorance or half knowledge in certain directions. That should go and acceptance of theories should be a matter of personal realisation. It is this spirit that has to pervade among us if we are to make real advance and if we are also to infuse into the students the highest standard of integrity.

III. It is my view that we are attempting to combine in the College course general engineering instruction plus a high degree of specialisation. I have compared the M.I.T.syllabus with the Madras University syllabus for the B.E.Degree in regard to reinforced concrete, sanitary engineering under sub heads water-supply and sewerage and sewage treatment. I find that while the advanced courses in these subjects are a matter of optional election in the 4th year in the M.I.T they are here made compulsory. On~~e~~ one side it is so and on the other side I find that the recent college productions arenot sufficiently well up in surveying and levelling which is one of the important basic items in the investigation of projects. There is therefore some re-adjustment neessary in the case of the Engineering College syllabs. Not having had day to day acquaintance with the College working I cannot fully go into the question of syllabus but it is my considered view that advanced teaching in mathematics, structural enginering, sanitation,hydrology and flood control, heat engineering, bridge design etc. should be a matter for evening classes to be taught by professors who do research day in day out and these subjects should be optional and open to election by students in the 3rd year

Another factor which seems to have been partly responsible for a deterioration in discipline in technical colleges is to be sought in the reduced control the college staff have over students, after the college diploma was removed------unlike the Arts examinations which are devised on a mass production scale, technical colleges, should provide for maximum personal contact between the staff and the students and the staff should have some effective method of control over students and in correcting them. This can be done by increasing the number of marks which the College work earns for a student,and which goes into the University pass total.

There must also be separate conduct marks allotted to each student by a small Board of the college staff and this also must go into the University pass total.

An immediate and effective method to improve the tone of the students' work, will be to recruit the first three students in the B.E.Examination direct into the Dept. as A.Es. with a years' probation; merit and conduct should be the sole criterion for this recruitment.

year and further speialisation in them should be a matter for post-graduate work which will obtain for the students the degrees of M.Sc., D.Sc. etc. While these lectures that will be delivered by the Research Professors will be so to say the rudiments for post-graduate courses they will be the advanced syllabus for the graduate course students. It is necessary for the completion of the graduate course that only one or two of these advanced courses should be taken by the students in their final year. If the college course is re-designed in the manner above suggested it should in my view be possible to reduce the course of instruction from 4 to 3 years. If in addition we can introduce in the arts course in the intermediate examination and also in high school classes some vocational subjects such as carpentry, smithy, free hand drawing, block letter printing wiring and even some chain surveying as optional subjects and, if admission into the Engineering College can take account of such vocational training in the high school and Arts College, then it should certainly be possible to limit the Engineering College course to 3 years.

IV. In the matter of specialisation I reproduce a few extracts from the Cornell University official publication.--

> "Experience has demonstrated that the secondary school student often lacks the ability to anticipate with accuracy the type of work for which he will ultimately find himself best adapted. Some of the largest industries, which offer the widest variety of opportunity within their own organisations, consider it necessary to observe even the engineering graduate for at least a year before deciding to what division of the company he should be assigned. Their records contain many instances of men who originally desired to become air-conditioning experts or airplane designers but eventually applied their personal aptitudes most successfully in such fields as power plant management or metallurgical research."

** ** **

> "No student can be certain that he will be offered precisely the employment that he desires at the time he graduates.

** ** **

"Like the village blacksmith, the narrow specialist in engineering may one dy find his speciality no longer in demand. Only a broad and intensive training in the fundamental sciences can fit an engineer to take advantage of new opportunities as progress in industry creates them".

** ** **

"Where it is feasible, that is to say, in the schools of Civil, Mechanical, and Electrical Engineering the freshman program has ben made nearly uniform, so that, if necessary, the student may have an additional year after his admission to discover in what general field his best work can be accomplished."

** ** **

"In all the schools, specialisation has been postponed until late in the course and limited both in character and in extent and opportunities have been made for requird and elective courses."

These extracts support the view that I hold that in the present poor condition of India a general practitioner in engineering is more in demand than the specialist. The speialists must be top ranking men stationed in the capital town and used primarily for preparing special designs. The general practising engineer in the mofussil should with sufficient specifications be able to carry out any work even though it is speialised such as a concrete road pavement or a water supply or a drainage scheme.

It is also desirable that the student is not entirely guided by his prediliction for his specialisation. This is what is done in the Cornell University.--

"During the first and second years the student is rated by his instructors. In the third and fourth years he is rated by a committee of five members of the faculty and five members of his own class whom he has selected as being especially capable of giving him an accurate rating... By this system there is available to every student information that he could not obtain otherwise and which should be of great value to him."

It is very necessary that each does not attempt to provide specialisation in every branch of engineer It must confine itself to one or two branches. Thus Vizag College would be well advised to under take spe courses in marine engineering, ship building etc. Th Madras College should ~~xxx~~ have specialisation in Ele tro~~l~~nics, thermal electricity, Building Research, hydro dynamic and hyd work and aero dynamic etc. The Coimbatore College do specialisation in mechanical engineering and hy hydro-electric work etc.

Another feature of most universities of the West is this as described in the Cornell University publication.--

> "Nonresident lecturers are canvassed to supplement the regular class-room instruction, lectures are delivered from time to time by non-resident specialists in the profession."

It is also my view that the College must interchange its professors with departmental people. A permanent professor might be there in the College for 5 years and he may go to the department for a year or two to supplement his theoretical knowledge with practical experience. Conversely a good theoretical practising engineer should be transferred to the College of Enginering (say for 2 years) where he will have the opportunity to give thepractical side to the students and at the same time improve his theoretical knowledge. Thus both the department and the College will stand to gain.

Most of the Research Professors that I have seen in the Universities in U.S.A. and even in England are men with field experience and are regularly consulted by the practising Engineers and departments in regard to various difficulties that are met with in the execution. Thus in one University the Research Professor is dealing with Road problems for which he has regular experimental road track available in his institution. Another professor is experimenting on a huge model in which he is reproducing the Tacoma suspension bridge and the aero-dynamic forces that the bridge was subjected to before it failed. Unless we create such research departments and correlate them with field work we are not likely to catch up with Western developments and make original advancements.

VI. It is also very necessary that in each vacation at least 6 weeks are spent by every student in big projects and works that are under execution in the

I would ask if there has been any falling off in the 100 per cent rigid interpretation of the word honesty among the students of the College. It is for the principals and the students themselves to reply. Perhaps the students' view can be obtained by secret ballot of their opinion which can be transmitted by them without their attestation.

It is my impression which I gathered when I delivered the University lectures under the auspices of the Annamalai University that the mofussil students showed more keenness to extract the maximum benefit from the lectures than what I thought Madras students might be. It looks that mofussil students live in a less artificial atmosphere than Madras.

One of the methods by which we can improve the general tone would be to import half a dozen top ranking research men from foreigncountries and put them in charge of the research branches of the College such as Soil Mechanics, Testing Laboratory, Photo-Elastic section, Road Research Laboratory, Building Research Station, hydraulic research, aero-dynamic research etc. etc. Of course laboratories in all these directions will have to be started or perfected and brought into line with modern practice. The Research Professors that are selected will have to be asked to equip these laboratories suitably.

If properly chosen the Research Scholars would not be afraid of defining their limitations accurately. It is only when such top ranking men boldly tell us which problems are within the reach of present day theories and which would be the subject of further research that we would throw off our hesitation to admit our own limitations. At present due to various reasons which we need not go into and for the major reason that we have often blindly followed foreign

Presidency. It should be the duty of the professors to assign the students to various works consistent with the aptitude of those studdents. Those students must also be given some subsistence allowance during that period of practical course. They should also be vested with responsibility. No one profits by any practical course unless he is paid something and he is also required to take responsibility. The departmental officers have very little time to look after such practical course students. It should be the duty of the professors who would be in charge of each batch of students distributed on 2 or 3 works to go round in that period of 6 weeks or so and find out how they profit by the practical training that they got and see to it that they utilise the opportunity to thebest advantage. If such practical training is given in every vacation then the practical course at the end of the 3rd year college course may be reduced to 6 months as a maximum. In addition during the other 6 weeks of the vacation special evening classes can be held with a view to help students to take advanced courses or to make good their deficiencies in particular subjects.

VII. We must also introduce military science in the college syllabus. Also some elements of Law of Contracts & public speaking.

To answer question (2)--

I. If the work turned out by the students helped by & the machines ~~and~~ the mechanics who give them instruction~~s~~ in the College Workshops should find a market then it is most necessary that the requirements of the Government departments at least such items as tables, tappal boxes, trays, confidential cupboards of steel, electric junction boxes , fish plates, clip bolts etc.for tram line, windows, ventilators etc. for houses are all standardised and each workshop is asked to produce a particular number of each one of these items. The students will have their training in the making of these articles and furniture and they could be distributed to the departments and cost recovered. It is only what is not covered by the payment by recovery towards the cost of the articles from the departments that need be debited towards the cost of training of the students in workshop practice.

So long as college laboratories and workshops give practical training without correlating them to the manufacturing side, the present position under which the students get a high theoretical education without active contact with the manufacturing aspect and without having later on scope to utilise what they have learned in the matter of design will continue. It will be of advantage to the future of the country that the Madras workshops and other workshops equally and conveniently situated are developed in the following manner.--

We must obtain foreign experts who have been actively manufacturing such machines as pumps, motors, generators, road rollers, switches, fans etc. and put them in charge of sections of our workshops. It may work out at a loss but they should be definitely asked to manufacture a few of these in our workshops and when they do it the students of the engineering colleges should be actively asked to work under them and learn the tricks of manufacturing. Students who have passed out from the engineering college should also be placed under these manufacturing experts and be required to design the various plant andalso actively follow up their manufacture and fabrication. I am aware that turning out a few road rollers or pumps or motors or generators every year by these experts will certainly not pay the Government. But the merit of this suggestion of mine lies in that the college students would get thoroughly trained in the intricacies of the manufacture of such machinery. After remaining in the workshops for 2 or 3 years as the case may be during which period the Govt. should even be prepared to pay a subsistence allowance to the practical course students, they will go out and either start large factories for mass production of these machinery or will join such factories already started.

I saw recently the equipment that has been obtained for Dr.Alagappa Chettiar's Poly Technic Chemical Engineering section. I consider that is certainly a move in the right direction. But at the same time I feel that unless the Government start their own small factories where they can manufacture their own ~~k~~ceramic products and others it is quite likely that for some years the chemical engineering education also is on the same level as the regular engineering education is at present or in otherwords the correlation between a high technical education and actual manufacture will be lacking.

Here I must say that it is very necessary that the Govt. improve their P.W.Department workshops. So far as my information goes industries workshops distributed in the mofussil have not been able to successfully to assist the agriculturists in getting their broken parts of machines and engines replaced. At the same time it must be admitted that the Madras P.W.Workshops have not been put to the very best use. On my enquiring what the reason for this is I am told and I also know personally that the Madras P.W.Workshops are one of the best equipped and unless it is kept continuously going by an even and continuous flow of massive work it is not likely to be worked to its full capacity. It is necessary that some assured work should be had for these workshops say making waggons and carriages for the South Indian or M.& S.M.Railways or making road rollers, pumps etc. These must be standardised and even if the standardised product should be getting out of date and a little uneconomical we should insist on those pumps etc.being used in the Presidency by the agriculturists and others.

If that is done the shops will have continuous and enough work, and can even go to the extent of having laboratories and research sections attached to it. ~~[illegible]~~ These will then help the workshops to keep uptodate and perhaps be also in advance of the time. ~~[illegible]~~. If quite necessary we must find some good experts in India or elsewhere to give it a new ~~[illegible]~~ bent and life.

⊗ If my vision is to be fully realised, it is very necessary that the Education, Engineering, Industries, Development and Finance Departments work in closest cooperation and that a single senior officer is entrusted with the work of coordinating these activities and getting something achieved.

⊗ I am now faced with the ~~[illegible]~~ question of making shutters for the Tungabhadra dam and sluices. I find that the quotations from England, Glenfield and Kennedy, Ransome and Rapiers, English Electric Co. etc. are terribly costly and their deliveries are not likely to be earlier than 2 or 3 years. We cannot certainly wait for such a long time and very soon we might find that these foreign companies try to make capital out of the fact that we are afraidto manufacture those shutters here. It is therefore most necessary that even at the risk of making mistakes and learning we should start manufacturing these sluice gates ourselves and unless we take project after project it is likely that the experience we gain at some considerable cost in making gates for one project might be lost. A sustained policy in this respect has to be enunciated if necessary by referring the question to a select committee. College students should in their second and 3rd years be taken to such large workshops which turn out heavy steel work; perhaps they may have to be taken as paid apprentices in these Shops at the end of their college course.

I. To answer question 3--

I consider that it is necessary to develop an engineering bias in the general educated public. To the Engineering students a really well equipped modern museum with working models, cut sections of various contraptions, etc. is necessary. I have seen both in London and in New York and in Chicago engineering exhibitions running from month to month. They attract very large crowds. Some of these contain Radar equipment. The experts in charge of which explains to the people its working. There are other sections where aeroplane engines have been pulled to pieces and their interiors are exposed to view. There are still others where cut sections of bombs ~~and~~ have been displayed. There are working models of various engineering devices. At the head of the Nile Delta 15 miles from Cairo they have got a special models room with a collection of wooden models of the Aswan dam, Esna barrage, Delta headworks etc.etc. It is very necessary that Madras starts an Engineering museum.

Submitted to the
H.M. for Education
N. Govindarajan
30-3-48
Special Chief
Engr.

EXTRACTS FROM THE MINUTES OF THE EXPERT COMMITTEE MEETING HELD ON 6-7-1946.

------oooOOOooo------

Present:
1. R.McIntosh Esq., Chief Engineer (General, Buildings & Defence) -- Chairman.
2. Berry Esq., Chief Engineer, Madras & Mahratta Railway.
3. Dr. R.G.Harris, Professor, Aeronautical Engineering, Indian Institute of Science, Bangalore.
4. Sri Dewan Bahadur A.V.Ramalinga Ayyar, Retired Chief Engineer to the Government of Madras.
5. Sri Lakka Raju Subba Rao, Representative of the Andhra University.
6. Sri S.Govindarajulu Naidu, Vice Principal, Law College, Madras.
7. Dr. V.M.Ghatage, Asst. Professor, Aeronautical Engineering, Indian Institute of Science, Bangalore.
8. Dr. K.L.Rao, Executive Engineer, P.W.D.,Madras.
9. Mr. F.H.Mc.D.Wilson Esq., Superintendent, Vizag Port.
10. Dr. J.J.Rudra, Principal, Arthur Hope College of Technology, Coimbatore.
11. Sri G.Sundaram, Chief Engineer for Electricity, Madras.
12. Prof. A.Viswanath, Organising Principal, Convener.

The first item considered was the institution of a three years' basic degree course in Civil, Mechanical and Electrical Engineering. The subject was discussed at length in which some members pointed out the indispensibility of a four year course as at present. It was finally agreed that a three year course is possible without lowering the present standards, by more intensive work and increasing the working hours. The Committee, therefore, resolved to recommend to Government:--

Resolution IV.i. That by intensive work and increasing the hours of work it is possible to provide basic degree course in Civil Engineering, Mechanical Engineering and Electrical Engineering of three years' duration instead of the present four years, without in any way lowering the present standards.

ii. That the Basic Degree courses of three years' duration should be the normal qualification for entry for Government and Public Services.

iii. That the Basic Courses mentioned above should provide a wide choice of optional subjects in the third year, so as to prepare the necessary ground work for such students as may desire to take any of the specialised post-graduate courses.

iv. That specialised courses of study leading to a higher degree or diploma of one or two years' duration according to the nature of the specialised courses should be organised in branches like Aeronautics, Highway Engineering, Automotive Engineering, Naval Architecture, Public Health Engineering, Minining Engineering, etc.