Scott. II-27—53,004—27-10-47

E. & P. (1948) Department.

Ms SERIES.

G.O. NO. 2783 Edn.

Dated 6-11-48

43

[Despatch Abstract.]

Techl. Edn. — Standing Advisory Board for Techl. Edn. — ~~Mn~~ Proceedings of meeting on 15.6.48. Papers recorded.

Back Papers.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

Further Papers.

G.O.	No.	Department.	Date.	G O.	No.	Department.	Date.

ABTE.No.13/48. **003721** College of Engineering, Guindy, Madras-15. Dated: 7th June 1948.

(2)

To

The Members of the Standing Advisory Board of Technical Education.

Sir,

Sub: Meeting of the Standing Advisory Board of Technical Education.

A meeting of the Standing Advisory Board of Technical Education will be held at 2-30 P.M. on Tuesday, the 15th June 1948 in the Council Chamber, Fort St. George. I am to request you to make it convenient to attend the meeting.

The agenda for the meeting is given below:-

(i) The matter of providing a course for Public Health Engineering in the Engineering College, Guindy.

(ii) The advisability of shortening the B.E. course to three years instead of the present four years.

(iii) Any other matter permitted by the Chairman.

Notes with regard to item (i) ~~xx~~ of the agenda will be sent by the undersigned in due course. The Principal, Arthur Hope College of Technology, Coimbatore will be sending notes with regard to item (ii) of the agenda.

K. Paul
SECRETARY. 7/6

...RY, MADRAS Library
... Secretary
...JUN 1948 Legislative Council,
ST. GEORGE Madras.

College of Engineering, Guindy,
Madras-15. Dated: 7th June 1948.

BTE.No.15/48.

To

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S. Paul
SECRETARY. 7/6

ASSISTANT SECRETARY, MADRAS LEGISLATURE
9 JUN 1948
FORT ST. GEORGE

for Secretary
Madras Legislative Assembly,
Madras.

Sectt. of the M.L.

Please see letter No.ABTE.13/48, dated 7-6-'48 from the Secretary, Standing Advisory Board of Technical Education at pages 1 & 3 ante.

The E.&P.H. Deptt., in their U.O.note No.29382/48 A.Edn., dated 4-6-'48, requested this Sectt. to make the Council Chamber available for holding the meeting of the Board at 2-30 P.M. on 15-6-'48. In reply they were informed that it was not possible to spare the Council Chamber and it was suggested that the Committee Room may be used for the purpose. This may therefore be sent U.O. to the E. & P.H. Deptt.

9/6. 9/6/48.

U.O.No. 3721/48-1 M.L.
9/6/48.

9/6 9/6 Exp. H dept

ASST. SECRETARY TO GOVERNMENT
11 JUN 1948
EDUCATION AND PUBLIC HEALTH DEPT.

42987

Edn and P.H. Dept

D.O. No. 29382A-7/48A Edn. 2. 12.6.48

Dear Col. Paul,

Meeting of the Standing Advisory Board of Tech. Edn
Your letter to the Hon'ble Minister for P.H. No. 13/48 dt 7.6.48.

I am to inform you that the Hon'ble Minister for P.H. will not be attending the meeting on the 15th inst and that he has instructed me to be present at the meeting on his behalf; I will accordingly be attending the meeting in the place of the Hon'ble Minister

yours sincerely

12/6/48

To Lt.Col S. Paul.
Principal, Engg College Guindy
(in charge)

12/6/48

12/6/48

in my place. sgg 12/6

MINISTER FOR EDUCATION
12 JUN 1948
GOVT. OF MADRAS

(6)

NOTE FOR THE MEMBERS OF THE STANDING ADVISORY BOARD FOR TECHNICAL EDUCATION FOR THE MEETING TO BE HELD ON TUESDAY THE 15TH JUNE 1948 AT FORT. ST.GEORGE, MADRAS.

****

SUB: Starting of a course in Public Health Engineering at the College of Engineering, Guindy.

INTRODUCTION.

From a perusal of the records left by Dr.Rudra, former Secretary of the Board, it is observed that the question of opening a course in Public Health Engineering was considered after the Bhore Committee published its report in 1945. The Government of Madras addressed the Chief Engineer, P.W.D. (General) and the Director of Public Instruction in 1947 and called for their remarks about the advisability of opening such a course for Madras. The Director of Public Instruction invited the Principal, Engineering College, Guindy to give his opinion on this question and his remarks are summarised as follows:--

(1) that the proposed course should be for training Assistant Public Health Engineers and should be an undergraduate course and not a post-graduate course;

(2) that the number of Public Health Engineers turned out annually depended on the requirements of the Province, and according to the estimates based on the Bhore Committee Report, 25 Public Health Engineers and 125 Assistant Public Health Engineers were required for the Madras Presidency.

(3) that the Public Health Engineering course could only be run in co-operation with the Medical Department,

(4) that a syllabus for such a course should be drawn up by the University to which the College is affilliated.

On the basis of the above recommendation, the Government of Madras addressed the Vice Chancellor of the University of Madras to consider the advisability and possibility of instituting a Degree course in Public Health Engineering in the University and to draw up a syllabus for this course. The Vice Chancellor convened a meeting of a Special Committee of which the following were members:-

1. The Vice Chancellor, University of Madras. (Convener).
2. Lt.Col.S.L.Bhatia, Surgeon General with the Govt. of Madras.
3. Dr.R.M.Mathew, Director of Public Health.
4. Dr.C.G.Pandit, Director, King Institute, Guindy.
5. Dr.P.V.Cherian, Principal, Medical College, Madras.
6. Dr.J.J.Rudra, Principal, Engineering College, Guindy.
7. Rao Sahib R.Subrahmanyam, Professor of Hygiene, Madras Medical College.
8. Mr.A.V.Raman, Retired Sanitary Engineer.
9. Mr.S.Ramachandran, Sanitary Engineer to Government.
10. Mr.S.K.Subrahmanyam, c/o Messrs.Gannon Dunkerley & Co., Madras.
11. Major B.H.Marley, Professor of Civil Engineering, Engineering College, Guindy.

The Committee after due deliberations adopted the following:-

(1) that a degree course in Public Health Engineering should be instituted in the University of Madras to form a special course of engineering study.

(2) that the entrance qualification for the degree should be Intermediate examination in Arts and Science with Mathematics, Physics and Chemistry as optional subjects.

(3) that the duration of the course for this degree should be 4 years as for other branches of Engineering.

(4) that the training for the first two years should be as far as possible common with the other branches of Engineering and should consist of Part I-Fundamental subjects comprising Mathematics, Physics, Chemistry and Natural Science (Biology), and Part II--basic engineering subjects, and the course for the next two years should be specialised training in Public Health Engineering followed by a period of practical training.

A Sub Committee consisting of the following was also constituted to draw up a suitable syllabus (Appendix A), and make recommendations about staff, laboratory, equipment etc.

1. Dr.J.J.Rudra (Convener)
2. Sri S.Ramachandran, Sanitary Engineer to Government.
3. Sri A.V.Raman, Retired Sanitary Engineer.
4. Sri Rao Sahib R.Subramanyam, Professor, Madras Medical College.
5. Sri S.K.Subramanyam, c/o Ms.Gannon Dunkerley, Madras.
6. Major B.H.Marley, Professor, Engineering College, Guindy.

This Sub Committee submitted their report to the main Committee in January 1948. An extract of the report of the Sub Committee (Appendix B) is enclosed herewith for reference. The recommendations of the Sub Committee were accepted by the Main Committee.

Subsequently, the Government of Madras addressed the Principal, Engineering College, Guindy, about the feasibility of starting this course in July 1948 beginning with the third year course. The Principal, in his reply, has stated that the Public Health Engineering course could not be started at the third year stage in July 1948, but that it could be started in the first year stage. No detailed proposals about staff, equipment, laboratory etc., have, however, been drawn up, except certain proposals with regard to staff.

POINTS FOR CONSIDERATION OF THE BOARD.

From a perusal of the records, it would seem that there is a great need for Public Health Engineers in India, especially in this Province. Although the University Committee was of opinion that this course could not be started in the third year stage, yet it is left for the members of the Board to consider the following points and see whether the course could not be started early in July 1948 for the third year stage at this College.

The introduction of the new syllabus in Engineering in 1948 by the University of Madras has made it possible for a large number of candidates to come out successful in the recent examinations held in April. The selection of 20 students for this new course would not deplete the demands made by other branches of engineering, but on the other hand would relieve the congestion that is likely to happen in view of the large numbers that have passed. The difficulty anticipated by the University Committee that the students of the third year would not have the particular knowledge of the Public Health Engineering subjects which they would have had in their curriculum of the first two years can be overcome by arranging a pre-third year course and by having special classes in those subjects. Whenever a new branch of engineering is opened, it takes sometime for the course to run satisfactorily and it is by trying out the course that improvements and alterations can be made in the syllabus. The opening of the course in July 1948 for the 3rd year students is therefore considered the right thing. This would be in keeping with the policy of the Government, which is ready and willing to meet the growing needs of the Province.

(8)

The introduction of Public Health Engineering as a separate course would naturally become an accomplished fact if the above is done. It would therefore be necessary to admit 20 more students in the Engineering College, Guindy, when admissions are made this year. These students would be specially selected for taking up this new course. The strength of the Guindy College would therefore be increased by that number. As far as Drawing Hall and Class Room accommodation is concerned, no difficulty is anticipated, but if the 75 ~~xx~~ students of the first year, now proposed to be transferred from the Arthur Hope College of Technology, Coimbatore to the Guindy College can be retained at Coimbatore, it would ease the situation considerably as far as the above and also for the hostel accommodation. The question of opening B.Sc. classes in Engineering Colleges is also under contemplation and it would be possible to do this at Guindy, if the Government will reconsider their decision and keep the Coimbatore college boys at Coimbatore. It would, however, be necessary to comply with the usual formalities of the University authorities in order to open the new course in Public Health Engineering and B.Sc. classes at the Guindy Engineering College.

In considering the opening of a separate course in Public Health Engineering, a note received recently from the Ministry of Education, Government of India is given below for consideration. In the meeting of the Chief Engineers of Provinces held at Roorkee on 13th April 1948, it was the unanimous opinion, " that basic training in all branches of Engineering, Civil, Mechanical and Electrical should only be conducted in Engineering Colleges and the College training should be broad-based and include subjects such as Geology, Economics and those grouped under what are called 'humanities'; that specialised training of young Engineers should preferably be carried out in the first place in the field by various administrations employing them; that research studies should be secured by attaching engineers to the various research institutions when these were set up". This resolution was passed when the Chief Engineers considered the advisability of having Highway Engineering as a separate branch of engineering in Engineering Colleges. What applies to one specialised form of training should equally apply to another form of specialised training, such as Public Health Engineering and it is for the Board to consider whether the Public Health Engineering course should be carried out in the manner suggested above or should form a separate course of study in Engineering Colleges. The note put up by Dr.Rudra, former Principal of this College and the opinion of the University Committee is that it should be a separate course.

If the course in Public Health Engineering is opened as a separate branch in the Engineering College, Guindy, for the third year students, there might be some apprehension about laboratory and other equipment. It will be possible during the course of the year to obtain the necessary equipment and set up a laboratory for this purpose. For a start, it is suggested that the Director, King Institute, Guindy may be asked to place such equipment as are required at the disposal of the College and the Chief Engineer, Corporation of Madras may also be similarly asked to place his experimental filters and other equipment connected with the water-supply scheme at the disposal of the College and other equipment belonging to the sewage disposal of the Corporation for giving laboratory work and practical training for the students of this course. The students can be taken to these places in the college bus for early morning or afternoon classes.

Dr.Rudra in his letter to the Government referred to above, has suggested the appointment of Messrs.T.K.George and K.Balasubramanyan as Instructors in Sanitary Engineering, one at the Guindy College and the other at the Coimbatore College. It is, however, suggested that both of them may be appointed in the category of Instructors at this College when the course starts here.

It would also be necessary to secure the service of part-time Lecturers or Instructors from the Medical Department. One of the above two may be transferred to the Engineering College at Vizagapatam when the College at Cocanada starts functioning there. As mentioned previously, an Engineering College can only run this course if it works in conjunction with the Medical College, and Vizagapatam seems to be the only other College which will be able to start a course in Public Health Engineering at a later date.

In the second item of the Agenda, the question of shortening the Engineering courses in the various Colleges from four years to three years is to be considered. As far as Public Health Engineering is concerned, it would fall in more or less with the proposal made by the Water Supply and Drainage Committee of the Government of Madras to run the course for a period of 36 months. In any case, it is anticipated that there would be less difficulty in shortening this course from four years to three years than the other branches of Engineering.

Some apprehension may be expressed that when the quota of 125 Assistant Public Health Engineers and 25 Public Health Engineers required for the Madras Presidency have been turned out at the end of 6 years or 8 years as to what would happen to the Public Health Engineers that will be turned out after that time. It is submitted that if qualified Public Health Engineers are found to be surplus, they can be usefully employed in the Municipal services. Moreover, it may be expected that in the future, the demand for Public Health Engineers may outstrip the Bhore Committee's recommendations, if the present Government plans for Rural and Urban development are implemented fully in all its aspects.

College of Engineering,
Guindy, Madras-15,
Dated: 11th June 1948.

PROFESSOR-IN-CHARGE
and SECRETARY, Standing Advisory Board for Technical Education.

To

The Members of the Board.

KS.

Appendix A.

SYLLABUS FOR THE EXAMINATION IN PUBLIC HEALTH ENGINEERING.

---

1. Mathematics I
   As for I B.E. (Civil)
2. Physics
   As for I B.E. (Civil)
3. Chemistry.
   As for I B.E. (Civil)
4. Applied Mechanics I.
   As for I B.E. (Civil)
5. Civil Engineering I.
   As for I B.E. (Civil)
6. Geology
   As for III B.E.(Civil)
7. Workshops
   As for I B.E. (Civil)
8. Mathematics II.
   As for II B.E. (Civil)
9. Electrical Engineering.
   As for II B.E. (Civil).
10. Strength of Materials and Theory of Structures I.

Behaviour of materials under test:- Methods of testing and appliances used in determining the elastic constants and testing materials to destruction under tension, compression, shear, torsion and bending; impact and hardness tests; tests under repeated and alternating stresses; fatigue of metals; factors of safety and working stresses, latest advancements in the science of testing materials.

Simple tests on limes, mortare, cement and concrete.

Beams:- Cantilevers, simply supported and overhanging beams subject to symmetrical or unsymmetrical static loading - Calculation of bending -- moment and shear forces; relation between load distribution, shear force and bending moment. Theory of simple bending proofs of formulae and their applications - Modulus of section - Strength of beams.

Deflection: Relation between curvature, slope and deflection; proofs of standard formulae and their application. Stiffness of beams; Evaluation of deflection from bending moment diagrams; beams of varying sections - propped cantilevers.

Fixed Beams:- Bending moment and shear force diagrams under symmetrical and unsymmetrical loading in fixed beams. Calculation of slope and deflection.

Distribution of shear and stresses in beam sections.

Columns and struts:- Long and short columns; axial and eccentric loading; effect of end conditions; equivalent lengths and slenderness ratio; eccentricity factor; column formulae, their derivations and practical applications; limitations of such formulae; strute with laternal loads.

Compound stresses and strains:- Stresses under combined strains, principal stresses and principal planes, ellipse of stress, Mehr's circle of stress - Principal strains.

Energy of strain:- in tension, compression, ~~xxix~~ bending and shear. Easy applications of strain energy methods to practical cases.

Torsion:- Circular shafts- Theory of pure torsion; shear stress angle of twist; strength and resilience; horse power transmitted; combined torsion and bending with or without end thrust; determination of principal stresses and maximum shear stresses; equivalent bending moment and equivalent twisting moment; formulae for square shafts.

P.T.O.

Helical springs:- Close and open coiled springs made of circular square cross-sections; Extension under pull, maximum shear stress, angle of twist and resilience.

Cylinders and Shells:- Stresses and strains in thin cylinders and shells subjected to uniform internal of external pressure or both. Thick cylinders and shells, stresses and strains under internal and external fluid pressures.

Deflection of perfect frames:- Evaluation of deflection by calculation and graphical methods in frames; Castigliano's theorem I.

Graphic Statics. Graphical determination of geometrical properties of sections such as areas, position of centroid, neutral axis and moment of inertia.

Bending moment and shear force diagrams for simple beams under static loading; section modulus figures.

Elastic curve for simply supported beams; bending moment and shear force and elastic curve for fixed beams.

Reciprocal diagrams for simple frame structures such as roof trusses and bridge girders like warren, Pratt and Petit types. Fink roof truss.

11. Mechanical Engineering.
    As for II B.E. (Civil)
12. Surveying
    As for II B.E. (Civil)
13. Civil Engineering II.
    As for II B.E. (Civil)
14. Building Drawing
    As for II B.E. (Civil)
15. Workshops
    As for II B.E. (Civil)
16. Mathematics III
    As for III B.E. (Civil)
17. Strength of Materials and Theory of Structures II.

Continous beams:- Theorem of three menents; analytical and graphical methods of determining reactions, bending moments, shear forces, deflection and slope; moment distribution methods.

Masonry structures:- General conditions of stability - Middle third rule - lines of resistance - distribution of pressure intensities-elementary principles of design of masonry dams, gravity and arched sections - causes of failures - stability of chimneys and shafts under wind pressure.

+Theory of earth pressure:- Customary methods of determining pressure due to earth on retaining walls such as Rankine's or Wedge theory and their limitations - Rankine's theory applied to foundations.
Introduction to soil mechanics.

Moving loads and Influence lines:- Curve of maximum bending moments and shear forces; enveloping parabola and determination of equivalent uniformly distributed loads; influence lines for reaction, shear force bending moment and deflection; stress influence lines for members of braced girders, reversal of stresses under live loads.

Suspension bridges and arches:- Elastic theory for rigid arches Eddy's theorem, stresses due to rib shortening and temperature changes; reactions and horizontal thrust in rigid, two hinged and three hinged arches. Two hinged arches with horizontal tie. Reaction locus, lines of resistance for rigid and hinged arches under dead and live loads. Influence line for three hinged and spandral braced arch.

Suspension bridges without stiffening girders and horages and towers.

P.T.O.

(12)

Redundant frames:- Theorem of least work; analytical and graphical determination of forces in members of roof strusses with knee braces; portal frames; anallysis of simple type of indeterminate structures.

Graphic Statics. Force diagrams for framed structures such as roof trusses with knee braces, portal frames and sway bracings.

Graphical determination of earth pressure and lines of resistance in retaining walls, dams and arches. Rebhann's construction for retaining walls.

Displacement diagram for steel trusses - Williot - Mohr diagrams.

Curves and maximum bending moments and shear force and the enveloping parabola for moving loads.

Influence lines for beams, girders and three hinged arches.

18. Hydraulics I.

As for III B.E. (Civil)

19. Structural Engineering I.

Reinforced concrete:- General principles; materials of construction and their testing - Grading and mixing - setting and hardening - strength of materials and allowable stresses - arrangement of roof and floor slabs; beams and columns; loads on floors.

Methods of design and calculation of stresses in reinforced concrete slabs, beams and T. beams:- Use of compression steel - Economic design of slabs and beams - Two way reinforced slabs - columns - short and long subject to bending (no tension), subject to bending with tension with ordinary and helical reinforcement - column footings - isolated and conbined. Reinforced concrete piles and pile caps Distribution of shear stresses in beams and shear reinforcement - adhesion and bend.

Arrangement of reinforcement and leading systems of reinforcement construction joints. Form work (centering, shuttering, strutting) precautions in fixing and order of removal.

Steel and timber construction:-

Steel construction: Order of proceedure in designing; estimating of loads selection of working stresses; protection against corrosion and fire, painting.

Properties of British standard sections - Detailed design of beams - compound girders and built up plate girders.

Design of plain and built up column section - assumption regarding end conditions - Data and practical formulae for design - Lacing - column bases and Grillage foundations.

Types of roof trusses in timber and steel - Limiting spans - Rise and camber - economical spacing - Date for design and practical rules design of tension and compression members - purlins - design of end bearings.

Timber structures:- Simple timber framing; resistance to compression. bending and shear - Design of timber beams - Strength of Joints and connections in framed timber structures.

Bridges:- General principles concerning the design and choice of bridges - Preliminary survey - Selection of site - location and borings collections of date - waterways - Determination of discharge of rivers with reference to area of water shed and by the intensity of rainfall and zoning - Depth of scour during floods - Economical spacing of piers standard dimensions for highway bridges - design of piers and abutments - detailed design of masoary arch bridges and culverts from Empirical rules and specifications.

Foundations:- Method of fixing out the bearing capacity of soils Trial pits and borings - Brick piers and footings - design of ordinary foundations.

Box, crate, well, pile, mass and reinforced concrete slab foundations - More difficult foundations such as Cofferdams - Well foundaxx

P.T.O.

(13)

foundation Cylinder foundations - Crib work. caisons and concrete monoliths - Underpinning.

20. Surveying.

Instruments:- Use and adjustments of -

Theodilite - transit, micrometer and double.reading.

Levels - Engineers improved level (Government of India pattern) Zeiss and gradienter.

Sextants - Nautical and Box.

Solar attachments - Burt and Saegmuller.

Telescopic alidade and plane-table equipment - Mining dial- . direct reading tacheneter - Curve ranger - Equatorial mounting.

Traverse Surveying:- Stations, Angles by repetition, Gale's method of plotting by co-ordinates, Distribution of errors.

Setting out of works:- Curves by theodolite - Simple, compound, transition, Curve tables. Setting out nnd measuring engineering works.

Tacheometric Surveying and subtense ~~xxxxxxxxxxxxxx~~ measurements:- Principle of stadia - Formulae, Field observations, Staves - Subtense bar, Field book - reduction by diagram, tables, slide rule, plotting by tacheometric protractor.

Triangulation:- Minor triangulation - choice of stations - triangle quadrilaterals - interlaced polygons - Signals - Erection - helietrope, Field observations - angles by reiteration - Vertical angle for heights Satellite stations - 3 point problem - intersected points. Base line - Instruments and accessories - invar type corrections - reduction of measurements. Adjustment of angles by method of equal shifts - least squares. Calculation of co-ordinates - plotting. Precise levelling - Maps and map making - problems in heights and distances.

Hydrographic surveying:- Soundings; Charting; cross section of streams and rivers; discharge of rivers, tides and tide reduction.

21. Sanitary Bacteriology and Sanitary biology:-

Sanitary bacteriology:- Bacterial environment, metabolism, carbon and nitrogen cycles. The roll of bacteria in disease. Collection of samples of water, sewage, soil, milk etc., Sterilisation.

Sanitary Biology:- Algae, fresh water biology, typical organisms of sewage, sludges, activated sludge, trickling filters etc. River pollution and beach pollution and their effects. Life of animals and insects concerned in the transmission of important diseases. Disinfection, fumigation, disinfestation. Elementary physiology and nutrition.

22. Water Supply and Public Cleansing I.

(a) Water Supply.

Sources - Characteristics, estimation of supplies available, conservation and development of water supplies.

Rainfall:- Catchment area - Runoff.

Surface waters - Lakes, tanks and impounding reservoirs, rivers, canals and springs.

Ground waters - springs, infiltration wells and galleries . shallow and deep wells, tube and bore wells.

Relation between geology and water supplies.

Estimate of requirements of water for various purposes, domestic and industrial.

Rural water supply.

(b) Public Cleansing:-

Wastes - different kinds of - sources, quantities.

Rubbish - collection, removal and disposal methods.

Excreta - collection - latrines - different types - removal and disposal methods. Trenching - composting, incineration, septic tanks etc.

Liquid filth - collection - cess pools - ordinary and leaching. Removal and disposal methods - land irrigation, dilution etc.

Soils - characteristics of - pollution and improvement.

23. Structural Engineering II.

Reinforced concrete.

Bridges - Basic principles of design of the following types of bridges - beam and slab, open spandrel, solid filled and bowstring girder arch bridges.
Tanks and towers:- General principles of design, methods & details of construction, detailed design of a reservoir or water tower - underground tanks.
Retaining walls:- Detailed design and methods of construction of cantilever and counter-fort type walls.
General:- General principles of design and construction of domes, piles and raft foundation. Swimming pools.
Vibration of concrete, water proofing, Guniting - Light weight concrete.
Basic principles of prestressed concrete.

Steel Work:-

Bridges; Date for design, simple designs of highway and Railway bridges of the plate girder and parallel chord, lattice girder types from specifications - Economical proportions - details of construction. Minimum clearance and head room - Bridge floors decking and Jack arches - troughing. Traverse and lateral bracing - pin and roller bearings - Arch ribs and spandrel braced for three hinged conditions. selection & design of members & connections.

Tanks and towers:- General principles of design and detailing of low and high tanks from specification domes.

Miscellaneous:- Retaining walls of masonry - methods of relieving side pressure and improving stability provision for drainage, expansion joints and other important constructional details - detailed design of gravity and panelled retaining walls.

Masonry dams:- Selection of site, principles of design of Gravity and arched types, practical profiles, uplift in masonry dams, drainage - expansion joints - methods of construction and causes of failures.

Masonry chimneys and shafts; Sea groins, outfall sewers in tidal estuaries - Litterol drift - wave action - ocean currents - works relating to the disposal of sewage into sea.

24. Hydraulics and Hydraulic Machinery II.
As for final B.E. (Civil).

25. Structural Engineering Design and Drawing.

Candidates will be required to show a good knowledge of (1) calculations and designs (2) drawing and detailing from specifications in respect of the following structures.
Masonry arch bridge or culvert; Causeway.
Reinforced concrete building, raft foundation, bridge of beam and slab type, elevated tanks, underground tanks, domes, retaining walls, box culvert or sub-way and xxx swimming pool.
A steal beam, plate girder, steel stanchion, base and grillage foundation, steel tank and selected members and connections in a steel lattice girder bridge.

26. (a) Highway Engineering.
Highway Engineering - As per III B.E. (Civil).
(b) Statistics. General and vital statistics. Application of statistics to engineering problems of rainfall, runoff, floods, population growth, sewage and water treatment.

27. Epidemiology and Public Health Administration:- Origin and spread of the more common diseases such as malaria, small-pox, cholera, typhoid, plague, typhus, influenza, tuberculosis etc. Relation between environment and health. Personal hygiene and prophylaxis.
Organisation and administration of Public Health in India and elsewhere. Port health and quarantine.

P.T.O.

28. Water Purification and Sewage Treatment.

(a) Water Purification:- Impurities in water and their effects on health. Standards for public and industrial use.
Quality of water - physical, chemical, bacteriological and microscopic analysis and their significance.
Self-purification of waters.
Purification of small supplies - domestic filters and household treatment water.
Principles of purification of large supplies - Storage, algal control, coagulation, sedimentation, filtration, slow and rapid - aeration. Turbidity, taste and odour control. Disinfection, water softening, corrosion control, incrustation control. Removal of iron, fluorides.

(b) Sewage Treatment:-
Quality and analysis of sewage:-
Screening detritus removal, sedimentation, dilution, land ~~xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx~~ treatment, artificial biological methods, tank treatment - aeration methods, activated sludge and sludge disposal. Standards for sewage purification.

29. Water Supply & Public cleansing II.

(a) Water Supply.

Principles governing and investigation, execution and maintenance of the following works:-

Rural & urban W.S. - Tube & bore wells, built & sunk wells. Infiltration galleries, dans, anicuts, storage reservoirs, intakes, valve towers, coagulation and sedimentation basins, slow sand and mechanical filters, aerators, clear water and service reservoirs - plants for chemical treatment - water softeners.
Pumping stations - pumping plants, air lift systems.
Disinfecting systems, distribution systems - balancing tanks, stand pipes and pipe lines and anciliaries.
Swimming Pools and Public baths.
Measurement of water - water meters - Plumbing.
Economics & maintenance of water works.
Water laboratories. Hot water supply.

(b) Public Cleansing.

Drainage - open drains for sullage and drains for storm water Disposal methods.
Sewerage - sewage - Estimation of . Infiltration of ground water and storm water.
Methods of preliminary investigation and design of projects. Principles of design, execution and maintenance of works connected with the following:-
Sewerage systems and component parts.
Sanitary fittings and plumbing. Closets, Urinals, sinks etc. Traps and Vents - House drains, silt pits, sewers, syphons, separators, manholds, various treatment tanks and disposal works.
Septic tanks - Imhoff tanks, sludge digestion and humus tanks - Trickling filters, contact beds, activated sludge plants - sludge ~~xxx~~ drying beds - vacuum filters etc.
Ventilation - cleansing and maintenance of sewers.
Sewage pumping stations and equipment.
Sewage laboratories.

30. General Public Health Engineering.

(a) Air control.

Air - composition of - Pollution of air - sources of - Impurities in air and their effect on health.
Physiological basis of ventilation.
Effect on health of humidity, temperature, altitude and pressure.
Standard of ventilation - their significance and application.
Methods of ventilation.
Examination of ventilation of buildings.

P.T.O.

Dust control - smoke abatement.
Heating and cooling.
Air conditioning.

(b) Lighting.

Natural and artificial - varieties of lighting units. Diffused light and glare. Recommended lighting intensities for various purposes.

(c) Town Planning.

Principles of village and town planning - zoning, slum clearance, Parks and Playgrounds.
Civic surveys.

(d) Housing:

Soils - suitability of - Building sites.
Requirements of various buildings (a) Residential (b) Educational (c) Places of Public assembly such as Cinemas, Theatres, Libraries, Lodging houses, etc. (d) Miscellaneous - Dhoby Khanas, Mortuaries - Cemeteries and crematoria.

(e) Food control.

Preservation and processing of foods - Pasteurisation, refrigiration, canning and dehydration. Principles of construction of dairy farms, cattle yards, slaughter houses, markets, and different buildings connected with food trade.

(f) Engineering in relation to disease control.

(i) Mosquito control. Life history and habits of vectors - Malaria surveys - recurrent, naturalistic and permanent methods of controlling larvae and adult mosquitoes. Design of anti-malarial drains in various circumstances - Canalisation. Flushing - River training - clearing.
Subsoil drainage - Filling - adult spray killing methods - construction of sprays. Preparation of larvicides and insecticides. Screening of houses.
Relation between Engineering construction - Irrigation and Malaria. Malaria control for Engineering projects etc. Filarial surveys - Drainage in relation to filariasis - Aedeas control.
(ii) Rodent control. Rat elimination and destruction. Rat proof construction and fumigation.
(iii) Fly control. Antifly measures - Prevention of breeding of flies. Protection of food from flies. Flyproof construction.
(iv) Health institutions. Principles of design and requirements of different kinds of hospitals, sanatoria, maternity and child welfare centres, health centres, disinfecting stations etc.

(g) Camp sanitation. Fairs and festivals - Labour camps and other temporary congregations. Public Health arrangements - layout accommodation - water supply - sanitary conveniences - waste collection and disposal - control of food establishments - lighting and control of animal housing.

(h) Industrial Hygiene. Effect of trades and industries on health. Sanitation of industries, location, ventilation water supply, sanitary conveniences, lighting etc. Measures for the abatement of nuisance, dust, smoke, fumes - safety measures etc. Trade wastes - Treatment and disposal.

31. Public Health Engineering Design and Drawing.

Based on sections 22, 28, 29 & 30.

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DS/11/6/48.

FIRST B.E. EXAMINATION IN PUBLIC HEALTH ENGINEERING.

Written.	Marks.	Periods per week.		Remarks.
1. Mathematics I.	100	5 lectures	2 tutorial.	As per first B.E. Civil.
2. Physics.	100	2 "	2 Practical.	"
3. Chemistry.	100	2 "	2 "	"
4. Applied Mechanics.	100	1 "	1 Tutorial.	"
5. Civil Engineering I.	100	2 "	4 Drawing.	
6. Geology.	100	1 "	2 Practical.	As per III B.E. Civil.
7. Workshop.	-	---	2 Practical.	As per I B.E. Civil.
Geometrical Drawing.	-	---	2 Drawing.	No examination.
Mechanical Engineering.	-	1 Lecture	--	As per I B.E. Civil but examination next year.
Total.		14 Lectures	17 Practical.	

Practical.		
Physics.	100	As per I B.E. Civil.
Chemistry.	100	"
Workshop.	100	"
Geology.	100	As per III B.E. Civil.

SECOND B.E. EXAMINATION IN PUBLIC HEALTH ENGINEERING.

Written.				
8. Mathematics II.	100	4 Lectures	2 Tutorial.	As per II B.E. Civil.
9. Electrical Engineering.	100	1 Lecture	2 Practical.	"
10. Strength of Materials and Theory of Structures I.	100	3 "	1 Tutorial. 3 Drawing. 2 Practical.	As per syllabus enclosed.
11. Mechanical Engineering.	100	1 "		As per II B.E. Civil.
12. Surveying.	100	1 "	3 Drawing 4 Practical	"
13. Civil Engineering-II.	100	2 "	-	"
14. Building Drawing.	100	--	3 Drawing.	"
15. Workshops.	-	--	2 Practical.	"
Estimating.	-	--	2 Tutorial.	As per II B.E. Civil, but no examination.
Total		12 Lectures	24 Practical.	

Practical.		
Strength of Materials.	100	(Change as in syllabus.) As per II B.E.Civil.
Surveying.	100	"
Electrical Engineering.	100	"
W orkshops.	100	"

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THIRD B.E. EXAMINATION IN PUBLIC HEALTH ENGINEERING.

Written.	Marks.	Period of work.				Remarks.
16. Mathematics III.	100	2	Lectures.			As per III B.E. Civil.
17. Strength of Materials & Theory of of Structures II/	100	3	"	4	Practical.	As per syllabus attached.
18. Hydraulics I.	100	1	"	3	"	As per III B.E. Civil.
19. Structural Engineering I.	100	3	"	5	"	As per syllabus attached.
20. Surveying.	100	1	"	6	"	do.
21. Sanitary Bacteriology and Sanitary Biology.	100	2	"	2	"	do.
22. Water Supply and Public Cleansing I.	100	2	"	4	"	do.
Total.		14	"	24	"	

Practical.

Strength of Materials.	100
Hydraulics.	100
Surveying.	100
Sanitary Bacteriology & Sanitary Biology.	100
Water Supply & Public Cleansing I.	100.

FINAL B.E. EXAMINATION IN PUBLIC HEALTH ENGINEERING.

Written.	Marks.	Period of work.				Remarks.
23. Structural Engineering II.	100	2	Lectures.			As per syllabus attached.
24. Hydraulics & Hydraulic Machinery II.	100	1	"	3	Practical.	As per B.E. final Civil.
25. Structural Engineering Design & Drawing.	100			4	"	As per syllabus attached.
26(a). Highway Engineering.	50	1	Lecture			As per III B.E. Civil.
(b). Statistics.	50	1	"			As per syllabus attached.
27. Epidemiology & Public Health Administration.	100	2	"	1	Practical.	do.
28. Water Purification and Sewage Treatment.	100	2	"	3	"	do.
29. Water Supply and Public Cleansing II.	100	2	"	4	"	do.
30. General Public Health Engineering.	100	2	"	4	"	do.
31. Public Health Engineering Design and Drawing.	100			6	"	do.
Total.		13	Lectures.	25	Practical.	

Practical.	Marks.
Hydraulics.	100
Water Supply & Public Cleansing II.	100
Design & Drawing. (Viva Voce).	100

Appendix - B

(19)

EXTRACT FROM THE REPORT OF THE SUB-COMMITTEE OF THE PUBLIC HEALTH ENGINEERING EDUCATION COMMITTEE.

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I. B.E. Degree course in Public Health Engineering.

6. At the very outset, the Committee came to the conclusion that the course in Public Health Engineering, should include the bulk of the subjects for the B.E. course in Civil Engineering, and in addition, have subjects in Public Health Engineering. We experienced serious difficulties in fulfilling this objective and at the same time adhering to one of our important terms of reference that for the first two years, the course in Public Health Engineering was, as far as possible, to be common with other branches of Engineering. Since the course in Public Health Engineering was to include the bulk of the subjects for the B.E. course in Civil Engineering, the course in the first two years could not be very different from the course for Civil Engineers which was also common to all types of Engineers trained in the colleges under the University. On the other hand, if the course for public health Engineers in the first two years was to be identical with that for Civil Engineers, it was not found possible to provide the necessary time for Public Health Engineering subjects in the third and fourth years.

7. The suggestion of Water Supply and Drainage Committee of the Government of Madras, that the course in Public Health Engineering should be of three years duration comprising 18 months "basic training" in Engineering and 18 months instruction in "Specialised subjects pertaining to all -- aspects of Public Health Engineering, not excluding Humanities", was considered. It was, however, felt that while all the Engineering courses of the Madras University were of four years duration, the course in Public Health Engineering could not be organised for three years duration. Moreover, a course having two distinct parts, 'basic Engineering' and 'Public Health Engineering', could not be conducted in our existing Engineering colleges, all of which are experiencing difficulties in the matter of staff and accommodation. To give effect to the recommendation of the water supply and drainage committee, it would be necessary to start a separate college for Public Health Engineering.

8. It appeared at one time that a course in Public Health Engineering, including the bulk of subjects in the Civil Engineering degree course and having Public Health Engineering subjects to the desired extent, will have to be of more than four years duration or be of a more strenuous nature, and would be difficult to fit into one of the existing Engineering colleges. It was feared that this would make the course unattractive. It will also be difficult to justify a course of more than four years in Public Health Engineering when the courses in other branches of Engineering were only of four years duration, and in countries which had a course in Public Health Engineering, the dration of the course was the same as for other branches of engineering which the Madras University has.

9. The committee after a long discussion and careful consideration came to the conclusion that to make the Public Health Engineering course a practical proposition, it should be of four years duration and should fit into the existing courses in engineering. To do this the Committee found it necessary to give up or reduce some of the subjects in the first two years course for Civil Engineering and to bring some subjects in the third and fourth year course in Civil Engineering to earlier years of the Public Health Engineering course to provide the necessary tome for Public Health Engineering subjects in the third and fourth years.

10. We give below the departures from the existing Civil Engineering course to fit in the Public Health Engineering course in the colleges which have a Civil Engineering course.

(a) First B.E. The subject, "Geometrical Drawing" in the first B.E. course which now occupies four hours per week is reduced to two hours and the time saved is allotted to Geology which is necessary for a Civil Engineer, and is taught to him in the third year. This was done with a view to release time in the third year for Public Health Engineering subjects, and it was felt that Geology could be done just as well in

P.T.O.

in the first year, as in the third year. A certain amount of Geometrical Drawing is very desirable for a Public Health Engineer, but this could be taught to the extent necessary without making it a subject of examination.

The question of teaching Biology in the first or second year was considered, but it was decided that it would be better to have it in the third year when the students start the study of Public Health Engineering subjects proper.

(b) Second B.E. Strength of Materials, Theory of Structures, and Structural Engineering are important subjects in the Civil Engineering course, and a Public Health Engineer must have as sound a knowledge of these subjects as a Civil Engineer. In the Civil Engineering course, a greater part of the time of a student in the final year class is taken up by these subjects. As the Committee was of the view that in the Public Health Engineering course, subjects in the final year should relate mostly to Public Health Engineering, it was found necessary to devote more time to Strength of Materials, Theory of Structures and Structural Engineering in the second and third years. To provide time for this, the Committee decided to delete Machine Design and Drawing from the second B.E. examination and to replace "Applied Mechanics II" by Strength of Materials and Theory of Structures". This would include Applied Mechanics II as well as certain portions of Strength of Materials and Theory of Structures of the III B.E. course in Civil Engineering.

(c) Third B.E. From the third B.E. examination in Civil Engineering, the subjects, Railway Engineering, Highway Engineering and Geology have been deleted, the latter having been included in the first year. Although Irrigation does not form a subject of examination in the third B.E., its teaching is begun during that year. Also Surveying is taught during the third year although there is no examination in that subject that year. It was decided to do all the Surveying required for Public Health Engineering students in the third year. The hours released by the deletion of Railway Engineering, Highway Engineering, Geology and Irrigation were to be devoted to the study of (a) Sanitary Bacteriology and Biology (b) Water Supply and Sewerage and (c) more of Strength of Materials and Theory of Structures and Structural Engineering than is taught in the third year B.E. Civil Engineering branch. Highway Engineering has been taken to the fourth year.

(d) Fourth B.E. In the fourth B.E. course, the only common subjects of the B.E. Civil Engineering course are:-

(a) Hydraulics and Hydraulic Machinery II, the syllabus for which is identical with that of B.E. (civil), and (1) Structural Engineering and Structural Engineering Design and Drawing, the syllabuses for which are different from those of B.E. (Civil) as parts of these have been transferred to the third year. The bulk of the time in the fourth year is devoted to Public Health Engineering subjects, viz., (a) Epidemiology and Public Health Administration (b) Water purification and sewage treatment (c) Water-supply drainage; (d) Highway Engineering and Statistics; (e) Sanitary Design and Drawing; (f) General sanitation and Malaria Engineering.

The syllabus for Highway Engineering would be the same as in the third B.E. (Civil). The lectures in this subject will be common with the third B.E. (Civil).

11. Schemes of examinations and syllabuses for the degree course in Public Health Engineering are given in the appendix enclosed herewith. (not sent).

II. STAFF FOR THE PUBLIC HEALTH ENGINEERING COURSE.

12. The course for Public Health Engineering proposed above can be conducted in the first two years by the staff of an Engineering College with some addition to the Civil Engineering staff in the second year. In the third year, additional Civil Engineering staff would be required and some Public Health Engineering and medical staff would be required.

P.T.O.

The full equipment of Public Health Engineering and medical staff would be required in the fourth year.

13. The Committee is of the opinion that immediate steps must be taken to obtain the Public Health Engineering staff, and recommends that the Professor and a Lecturer in Public Health Engineering may be selected as soon as possible. The person selected for Professorship should be sent to U.S.A. for post-graduate study and practical experience for a period of two years. The persons selected for Lectureship should be sent to the All India Institute of Hygiene for the one year course of Master of Engineering in Publec Health, to be started from June 1948.

14. Four Engineering colleges of the Madras Government have or will have B.E. course in Civil Engineering. Sanitary Engineering is a subject in this course. It is however, observed that these colleges do not have staff with special knowledge of Sanitary Engineering. The Committee is of the opinion that each of these colleges should have a Lecturer in Sanitary Engineering and suggests that the Madras Government may be advised to depute suitable men to All India Institute of Hygiene, Calcutta for the Master of Engineering course in Public Health with a view to provide suitable teachers in these colleges for teaching the subject of Sanitary Engineering.

III. POST-GRADUATE COURSE IN PUBLIC HEALTH ENGINEERING.

15. The Committee is of the opinion that a post-graduate course in Public Health Engineering can only be started after fully organizing a graduate course in Public Health Engineering. Until then, Civil Engineers desiring a post-graduate course in Public Health Engineering may take advantage of the course started at the All India Institute of Hygiene, Calcutta.

IV. LICENTIATE COURSE IN PUBLIC HEALTH ENGINEERING.

16. According to the recommendations of the Water Supply and Drainage Committee, a larger number of Junior Public Health Engineers are required. Those are of the Licentiate standard. Their course should include Civil Engineering as well as Public Health Engineering, as in the case of the degree course, As courses of the Licentiate standard in various branches of Engineering are drawn up and conducted by the Government the course of Junior Public Health Engineers or Licentiates in Public Health Engineering, should also be drawn up by the appropriate Department of the Government and conducted by the Government.

V. COLLEGE IN WHICH A DEGREE COURSE IN PUBLIC HEALTH ENGINEERING MAY BE STARTED.

17. The Committee is of the opinion that the course in Public Health Engineering may be started at the College of Engineering, Guindy, in co-operation with either the Madras Medical College or the King Institute, Guindy. The latter may be more convenient for the college, if possible.

18. It is suggested that the course may be started from July 1948, if the Government of Madras accept the suggestion of the Committee to appoint a Professor and a Lecturer and depute them for advanced study.

19. The buildings, equipment etc., required for conduct of the course may be left to the staff of the Public Health Engineering course. From this consideration it is very important that a Professor of Public Health Engineering should be appointed as early as possible.

College of Engineering, Guindy,
Madras 15: Dated 23-1-1948.

J.J. RUDRA,
Convener,
Sub-Committee of the Public Health Engineering Education Committee.

DS/9/6/48.

5 JUN 1948
GOVERNMENT OF MADRAS

ASST. SECRETARY TO GOVERNMENT
14435
16 JUN 1948
EDUCATION AND PUBLIC HEALTH DEPT.

G.P.H. (2)
May be filed.
18.6.48
9/6/48

Notes of speech delivered by Hon'ble Sri T.S. Avinashilingam, Minister for Education, at the second meeting of the Standing Advisory Board of Technical Education held on 16th June 1948.

I am glad to welcome you for this second meeting of the Standing Advisory Board of Technical Education. We have two important matters to consider in this meeting. But before going into the subjects in question, I would like to refer to the progress in Technical Education in this Province. I do not know whether you are aware that our Province provides the greatest amount of facilities in the matter of technical education when compared to all the other provinces in this country. There were only two Engineering and Technological colleges in the Province in 1944, their number increased to three in 1945, four in 1946 and as many as six in 1947 apart from the numerous Polytechnics that have been opened in the Province in recent years. The number of boys admitted in the colleges has also correspondingly increased. It has risen from 680 in 1945 to 1,300 in 1947. I need not mention here that in this year the number in our Engineering colleges would also increase to a considerable degree because of the higher classes that we are opening in three of our new Engineering colleges. There are in addition a number of Polytechnics opened in the various parts of the province where L.M.E. of various types and grades are being trained. So also the subjects that we have provided for in our Engineering colleges have also increased in their variety and in this meeting we will consider the advisability of opening a new course in the Engineering college and that is Public Health Engineering.

I have also great pleasure in being able to tell you that the Institute for Electro-Chemical Research will be opened at Karaikudi and Mr. Sir M.A. Alagappa Chettiar who is responsible in a large measure in persuading the Govt. of India to have it opened in that place tells me that Pandit Jawaharlal Nehru, the Prime Minister of India, will lay the foundation stone for the Institute in the last week of July. Negotiations are also proceeding for the establishment of a Textile Research Institute at Coimbatore where the textile industry has come forward to contribute nearly 20 lakhs of rupees for it.

Before coming to Public Health Engineering itself, I would like to take this opportunity to explain the position of admissions in Colleges and the additional seats that have been made available in our Arts Colleges. The candidates who appeared for the School Final examination this year number 51,338 of which 26,116 have been declared eligible for admission to colleges. For the Intermediate in the Madras University area 8,000 candidates appeared of which 4,378 were considered to have passed fully in the Intermediate classes. We may roughly presume that half the number of the S.S.L.C. eligible candidates, and about three-fourths number among those who have passed the Intermediate will seek admission in B.A., B.Sc., and other post-Intermediate courses for this year. In the Intermediate in the Madras University alone including the fresh affiliation that has been given to 4 colleges of which one is a Govt. college, about 11,245 seats have been provided in the Intermediate classes and 5,838 seats have been provided in the post-Intermediate classes as against 11,005 and 5,115 in the last year. In the Andhra University area also 6,570 seats are being provided this year for both Intermediate and B.A. as against 6,211 in the last year. Thus it will be seen that there is sufficient accommodation provided for every one who wants to go in for higher courses. In this year nearly 1,500 additional seats have been provided for in colleges and there is a reasonable chance of all boys applying for admission getting a seat in the colleges

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May be filed.

10 JAN 1945

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Now coming to the subjects in the agenda, the first is the introduction of a new course in Public Health Engineering in one of our Engineering Colleges. The Public Health Department has put forward proposals for opening a fresh subject under this head. This was considered by a Sub-Committee consisting of the Vice-Chancellor of the Madras University, the Surgeon-General, the Director of Public Health and some Principals of the Engineering Colleges. A further Sub Committee was appointed to draw up a suitable syllabus and make recommendations about staff, laboratory and equipment and those particulars have been supplied to you for your information. The Govt. are anxious to start this course, if possible, even in this year and I would like to have your opinions in the matter.

The next subject that is under discussion before you is the advisability of shortening the course in the Engineering Colleges from 4 years to 3 years. The Interim report of the Scientific Man Power Committee appointed by the Govt. of India recommended as follows. 'At present the courses in engineering extend over a period varying from three to four years. We have every reason to presume that with judicious selection for admission to engineering colleges, it should be possible to reduce the period of training to three years. We understand that the All-India Council for Technical Education have prepared a draft curriculum and syllabuses of studies which it should be possible to cover in three academic sessions of 1400 hours each as against the commonly prevailing four academic sessions of less than 1000 hours each. We, therefore, recommend that the universities should consider the introduction of three-year-degree courses in engineering. This would shorten the training period, and also largely help in the increase of the number of engineers."

They have also recommended the examination of the advisability of introduction of double shifts in some of the colleges. I had the honour of convening a preliminary conference of the various Principals of the Colleges, the Chief Engineers of Govt. and the Vice-Chancellor of the University to consider this matter and a sub committee consisting of some of the Principals and other experts was set up to go into the matter. That Committee has not yet published its report and I am sure that your views in the matter will help the Committee in going through the matter.

There is one other matter which may be considered at this meeting of the Board and that is the question of inclusion of the subject of anti-erosion measures for the Engineering courses. The Government request your expert advice in all these matters.

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Secretary, E.& P.H.

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This file is with regard tothe second meeting of the Standing Advisory Board of Technical Education. The conclusions of the conference will be reported by the Secretary of the Committee. On receiving it, I will send it on to ~~xxx~~ office for action.

17.6.48

H.M.Education.

SECRETARY, EDN. AND P. H. DEPT.
18 JUN 1948
GOVERNMENT OF MADRAS

(24)

NOTE FOR THE MEMBERS OF THE STANDING ADVISORY BOARD OF TECHNICAL EDUCATION FOR THE MEETING TO BEHELD ON TUESDAY THE 15TH JUNE 1948 AT FORST ST. GEORGE, MADRAS.

Sub: Advisability of shortening the degree course to 3 years instead of the present four years.

In April 1948, the Hon'ble Minister for Education summoned a Conference consisting of the following gentlemen to discuss the question of reducing the duration of degree course in the Engineering colleges from 4 years to 3 years.

1. The Hon'ble Minister for Public Works.
2. Dewan Bahadur N. Govindaraja Iyengar, Chief Engineer (Special).
3. Sri Rao Bahadur A.R. Venkata Acharya, Chief Engineer (General)
4. Sri Rao Bahadur G. Sundaram, Chief Engineer, Electricity.
5. Sri. M.V. Subramanyam, Secretary to Government, Education Department.
6. Dr. J.J. Rudra, Principal, Engineering College, Guindy.
7. Prof. A. Viswanath, Principal, Arthur Hope College of Technology, Coimbatore.
8. Dr. Sir A. Lakshmanaswamy Mudaliar, Vice-Chancellor, University of Madras.

This question was raised because the Scientific Man Power Committee of the Government of India recommended in their Interim Report that the reduction of the degree course from 4 years to 3 years would result in a great saving of expenditure for Government and also in the out-turn of Engineers annually and in easing the difficulty of providing accommodation for students in residential institutions. The above Committee tentatively agreed that the course may be reduced from 4 years to 3 years. A Committee consisting of the following gentlemen was constituted to draw up a suitable syllabus for the various branches for three year course.

1. Sri. A.R. Venkata Acharya, Chief Engineer (General) Chairman.
2. Sri. G. Sundaram, Chief Engineer for Electricity.
3. Dr. J.J. Rudra, Principal, Engineering College, Guindy.
4. Lt. Col. S. Paul, Professor of Mechanical Engineering, College of Engineering, Guindy.
5. Dr. K. Sukumaran, Professor of Electrical Engineering, College of Engineering, Guindy.
6. Prof. P.R. Ramaswamy, Professor of Civil Engineering, Arthur Hope College of Technology, Coimbatore.
7. Prof. A. Viswanath, Principal, Arthur Hope College of Technology, Coimbatore.

Prof. A. Viswanath, the Convener of this Committee has sent a questionnaire to the other members of the Committee. So far, the Committee has not met for any discussions on this subject. A meeting has been arranged for Monday, the 14th instant at 4 P.M. at the Library Hall of the P.W.D. offices, Chepauk. A syllabus prepared by the Chief Engineer, (General) for the Civil Engineering course for a period of 3 years, has also been circulated for members of this Committee. A syllabus drawn up by the All India Board of Technical Studies for a Diploma in Engineering for a three year course has also been circulated for reference to the members of this Committee.

On receipt of the communication from Prof. Viswanath, I discussed this matter with the heads of the various departments of this college

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who were available. All the heads of departments were of the opinion that the question must be examined thoroughly in all its details. If the object of reducing the course is for the purpose of turning out more Engineers, it will not be gained by shortening the course. Whatever be the duration of the course, the annual outturn of Engineers would still remain the same unless the admission to the colleges are increased. From the records available on the deliberations of the Standing Advisory Board for Technical Education, there appears to be a great demand for Engineers in this Presidency, for the next 5 years and this is expected to grow more in the years to come. The demand cannot be met fully by the present Engineering colleges and the move to shorten the course from 4 years to 3 years seems to be to meet this unexpected demand. Unless some solution is found to increase the number of admission in every college, or to open more Engineering colleges, it is anticipated that this demand would never be met by the existing Engineering institutions.

As far as the expenditure to Government is concerned, it is not known how the shortening of the course would reduce the expenditure to the Government. The same equipment, the same staff will have to be there whether the course is three years or four years. There would be a certain reduction in the accommodation required for lecture halls, drawing halls and the hostel. The expenditure incurred by a parent in seeing his son through an Engineering course would also be reduced by 25%. Beyond these points, the position would not be altered in any way as far as the annual outturn of Engineers are concerned except that during the transition period the outturn will increase only for one year. For example, if 365 students are admitted every year in the Engineering colleges, the outturn of the Engineers will be increased by 365 for that year and not one more in the remaining years.

There are two schools of thought as far as Engineering studies are concerned. In the U.K., the ordinary course of engineering is for a period of three years. In the U.S.A., the practice in first class institutions is to have a course for a period of 4 years followed by a course of one year on specialised subjects if required. To a great extent, the heads of various Engineering departments are influenced by the practice followed in the U.K. There seems, however, a great change at the present day, to accept the practice followed in highly industrialised countries like the U.S.A., and places in the Continent like Germany. The selection of candidates for overseas studies in Engineering seems to be more than 50% to the U.S.A. than to the U.K., and more perhaps may have been sent to the U.S.A. except for want of securing places in these Universities. If a highly industrial country like America, contemplates a course in Engineering for 4 years and are not at the moment considering a reduction to three years, it is left to the members of the Board to consider this aspect and examine all the implications before the regular course in the Madras Presidency is reduced to three years. In this connection the attention of the members of the Board is kindly invited to the resolutions passed by the expert committee on 6-7-46 which seems to be a more feasible plan.

With the experience that I, as member of staff of this college have had for the last 25 years, in the teaching of Engineering subjects, to the Intermediate students of the Madras University who hail form all parts of the Presidency, I am of the opinon that it would be detrimental to the efficiency and the standard of Engineers if the course is reduced from 4 years to 3 years. It is not difficult to draw up a syllabus for any course of engineering and this syllabus can be fashioned on the -- syllabus of institutions that have been existing for some time. But local difficulties have got to be surmounted. The syllabus that has been drawn up for the different branches of engineering of the Madras University has been, to my knowledge, changed three times in the light of experience from observations made from time to time about the Engineers turned out from this college. The students that have been turned from this college have acquired sufficient knowledge of fundamental engineering so that when they are absorbed in the various departments, they are able to fit in and pick up the required knowledge to carry on the work of the

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department efficiently and well. The Graduates of the Madras University in Engineering are to-day spread all over India. They are manning the Railways in the North West Frontier, Delhi, Calcutta, Bombay, right to the East, West and South as far as Dhanushkodi. On the occasions when I have had to travel to these places on official business, it was a very pleasant surprise to see the students of this college holding important positions in the Railwayx services. This is due to the fact that in the All India Competetive Railway Examinations, Graduates of the Madras University have secured top places and have built up a record, about which the Engineering college at Guindy may well be proud. The record set up by successive Chief Engineers xxxxxxxxxxxx Superintending Engineers of the P.W.D. and Graduates of the Engineering College is worthy of note. To-day there are even specialised Chief Engineers old boys of this Institution. In the World War II Madras contributed the largest number of Engineers to the Armed Forces. In the words of Major-General Dinghead, Director, Mechanical Engineering Directorate, the Madras graduates were not only the best as far as Engineering knowledge was concerned, but were easily the best in general knowledge department behaviour and all that goes to make a good engineer officers. No less is their record in the Superior Telegraphs, Signals and in recent times in the Civil Aviation. I attribute this success to the fact that the course that has been developed in this college is sound because it is spread over a period of 4 years. It takes a certain amount of time for engineering knowledge to soak in to the minds of Intermediate students who come from various places from the mofussal and who have not the advantage that other countries posses in being surrounded by the latest developments in Engineering. It might come as a surprise to many that some of the students who are admisted in the engineering colleges have never seen a smith's fire and have never handled a spanner in their life. This initial background is bound to change soon when the craft training in the schools in the bifurcated courses in the High Schools are well on their strides. But, it is submitted that even with this background, the students who seek admission into the Engineering colleges are still very young unlike those in other countries, the average age being 17, and they do want a certain time to nature and xx develop in the xxx atmosphere of an Engineering college before they can take on responsible positions in engineering services.

If the object of the shortening the course is for the purpose of turning out more Engineers for the demand that is expected from the services, it can be achieved in another manner. The Scientific Man Power Committee of the Government of xxxx India have suggested that in order to increase the outturn of Engineering institutions, the shift system may be introduced in the various colleges now training Engineers. Under ordinary circumstances, it is not desirable to introduce shift system as the mere imparting of technical knowledge to students is not the only duty of an Engineering institution. The organisation of extra mural activities development of the physical stature of youths, the organisation of other forms of training, such as, military training are just as much a part of the education that we have to give to Engineering students in the daily routine of work. Many of these things are rushed and there is hardly time to properly organise and conduct these activites on a sound basis. The demand for Engineers being so great some sacrifice must be made in this direction.

The shift system can be worked in the Engineering College at Guindy. I envisage a procedure like this. The proposal to open the B.Sc. classes for 60 students must be abandoned. The first year admissions about twice the present number would be divided into two sections and duplicate lectures should be conducted for all subjects. This has been done during the last two years when the Anantapur Engineering college was located at Guindy. An increase of 100 students in the admission would replace the 130 Anantapur students now being shifted to Anantapur, provided the 75 Coimbatore students are kept at Coimbatore. Hostel accommodation for the second year course can be arranged by transferring the xxxxx War Technician Survey section now occupying one block to some other centre. There is sufficient accommodation for Drawing halls, Class rooms and Laboratories. The second year work for double the number will also be done in the same manner and no difficulty is anticipated. For the third year, the distribution of students which is now Civil 60; Mechanical 25; Electrical 30; - - - -

P.T.O.

Telecommunication 10 would be Civils 85; Mechanical 25; Automotive 25; Electrical 60; Telecommunication 10; Public Health Engineering 20; Total 225. The fourth year students who are now distributed Civil 40; Highwyas 20; Mechanical 25; Electrical 30; Telecommunication 10; Total 110 would be Civil 65; Highways 20; Automotive 25; Electrical 60; Telecommunication 10; Public Health Engineering 20; Total 225.

The abolition of the Licentiate class after two yearsx would give the necessary accommodation during the years if the Polytechnics are organised the overseer classes now conducted at Guindy are also transferred to the Polytechnics, it would give adequate accommodation for the Drawing halls, Lecture halls, class rooms and hostels.

The hours of work for the shift would be more or less as given below. At the present time, the students work from 6-30 to 8-30 in the laboratories and workshops. From 10 to 12-30 the time is mainly devoted to lecture classes of three periods. From 1-30 to 4, the students spend their time either in the laboratories or in the drawing halls. Saturday is not included as a working day except for certain laboratory classes for non-U.O.T.C. students. In the shift system suggested, it is proposed to have one shift to working from 6-30 to 8-30 in the workshop and laboratories while the other shift has no work. From 8 A.M. to 10 A.M. the second shift willhave work in the laboratories and workshops like the first classes together from 10-00 to 12-30 P.M. In the afternoon, laboratory work and drawing classes will be distributed between the two shifts from 1-30 to 4 P.M. Survey field work should be arranged for both the shifts only in the morning between 6-30 to 10 A.M. and the survey field work for all the Overseer and H.L. classes should be shifted from the morning to afternoon from 1-30 to 5 P.M. It would however, be necessary to work out the exact time table of how the classes can be fitted in, but, as a general rule, in the discussions with the heads of various departments of this college it is found possible to work the shift system satisfactorily, provided the xxxx staff and the technical personnel are adequately increased to meet this extra work. As far as the equipment is concerned, equipment which is not used at least 8 hours in the day has only half its value for the institution. In the shift system, the equipment will be constantly used and in any case even for laboratory tests, an engine or a motor generator is not run for more than 1½ hours during a 2 hour period. The use of the equipment for longer hours would not produce undue wear and tear on the machinery, but on the other hand would facilitate the replacement of such equipment within a reasonable period of time and would give an opportunity to replace it by a more uptodate equipment. Many items in laboratories at the present moment have outlived their instructional value and their usefulness as far as instruction is concerned is nil. But, they are still quite serviceable on account of the short number of hours that they have actually been used for instruction purpose as compared to the actual number of hours that they would have been commercially used in any department.

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It would then be seen that as compared to the ~~xxxxx~~ 125 students admitted every year into the Engineering College at Guindy, it is - possible to increase the admissions by about 100 and admit 215 - students by working the shift system and opening new courses such as Public Health Engineering and Automotive Engineering.

The opening of the course in Public Health Engineering at the Guindy College will be discussed as item (1) of the Agenda and as the Professor-in-charge of this College, I envisage little difficulty in having this course opened in July 1948.

A syllabus in Automotive Engineering has been drawn up, approved and passed by the University authorities and the degree course in this subject is possible in the Madras University if a College can put up sufficient equipment and staff to open this course. In 1945, as Professor of Mechanical Engineering, I proposed to the Principal of the College of Engineering, Guindy to allow me to open this course at the Guindy College. In reply, he stated that as the Government's - policy was to open this course at the Coimbatore Engineering College, I would have to defer this question. I repeated this request in 1946 and 1947 and stated that as I had sufficient laboratory accommodation, college equipment and other equipment left by the I.E.M.E. Section of the U.C.T.C. which had been cancelled after the cessation of hostilities, I was in a position to open this course at the Guindy College. In addition the Government of Madras in their G.O.No. 1142Edn. MS/6-5-48 have this year sanctioned a sum of Rs.3 lakhs to be spread over two years for the purpose of strengthening the Mechanical Engineering Department of this College, 1½ lakhs of which is to be spent entirely for Automobile equipment to form part of the Mechanical Engineering Course at the College, the balance being for additional equipment for basic Mechanical Engineering. I would place these facts before the Board and request the Government of Madras permission for opening this course at the Engineering College, Guindy, on account of the facilities which the Institution has at the present moment. If in future years, this branch of engineering has to be developed at the Engineering College, Coimbatore, which is now faced with the problem of finding accommodation for its existing classes, the course can be transferred to Coimbatore, when the College is placed on a permanent footing as far as Buildings and equipment are concerned.

In conclusion, I would request the members of the Board to give their kind and sympathetic consideration to the points raised by me about the shortening of the course from 4 years to 3 years. I suggest that the Sub-Committee appointed for this purpose may examine this question at length and go into the details of the Time-table and syllabuses during the course of this year so that it may be adopted at the beginning of the next academical year. In the meantime in order to meet the urgent demands of the services the shift system on the lines suggested above may be started. The Medical College at Madras, I understand, is working a shift system in order to turn out Doctors in larger numbers to meet the increased demand for Doctors. The same procedure can now be adopted for the Engineering College at Guindy, provided the Government is prepared to sanction the extra staff that will be needed for this purpose.

S. Paul 14/6

College of Engineering,
Guindy, Madras-15,
Dated: 13th June 1948.

Professor-in-Charge
and Secretary, Standing
Advisory Board for
Technical Education.

Copy submitted to the Hon'ble Minister for Education
Madras

(29)

SUB: SHORTENING OF THE ENGINEERING DEGREE COURSES TO THREE YEARS' DURATION INSTEAD OF THE PRESENT FOUR YEARS, WITHOUT LOWERING THE STANDARDS.

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The Expert Committee, appointed by the Government of Madras for working out details of the new Engineering Colleges, in their meeting dated 6th July 1946 recommended to Government:

"(i) That by intensive work and increasing the hour 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.

2. The Technical Manpower Committee of the Government of India, in their interim report have pointed out that the present four year Degree Courses of Engineering Colleges should be shortened to three years and this would be one of the means of securing the additional technical manpower required for Post-war Developments. To discuss the subject, the Hon'ble Minister for Education, Madras, convened a Conference on the 25th April 1948 at which the following were present:

1. Hon'ble Sri T.S.Avanashilingam Chettiar, - H.M. Education - Presiding
2. Hon'ble Sri M.Bhakthavathsalam - H.M. (P.W.)
3. Sri Dewan Bahadur N.Govindaraja Ayyangar, Chief Engineer(Spl)
4. Sri Rao Bahadur A.R.Venkata Acharya, Chief Engineer (Irrgn.)
5. Sri Rao Bahadur G.Sundaram, Chief Engineer for Electricity.
6. Mr. M.V.Subramanyam, I.C.S., Secretary, Edn. & P.H. Dept.
7. Dr. J.J.Rudra, Principal, College of Engineering, Guindy
8. Prof. A.Viswanath, Principal, A.H.College of Tech., Coimbatore
9. Dr. Sir A.Lakshmanaswami Mudaliar, Vice-Chancellor, Madras University.

The general opinion of all the Members was in favour of shortened ~~xxxx~~ three years' courses. A Sub-Committee was then appointed to work out the details for giving effect to the three year courses with the following members:

1. Sri Rao Bahadur A.R.Venkata Acharya, Chief Engineer (Irrgn)., CHAIRMAN.
2. Prof. A.Viswanath, Principal, Arthur Hope College of Technology, Coimbatore, SECRETARY.
3. Dr. J.J.Rudra, Principal, College of Engineering, Guindy.
4. Dr. Sukumaran, Professor of Electrical Engineering, Guindy.
5. Lt. Col. Paul, Professor of Mechanical Engineering, Guindy
6. Prof. P.R.Ramaswamy, Professor of Civil Engineering, Arthur Hope College of Technology, Coimbatore.
7. Sri Rao Bahadur G.Sundaram, Chief Engineer (Electricity).

This Committee will be holding a meeting on the 14th June 1948 to discuss measures for shortening the course without lowering the standards and formulate details of the schemes of study, syllabuses, allocation of subjects and periods, examinations and working time schedules.

To facilitate discussions of all aspects, the following materials and information have been obtained.

(i) Copy of the curriculam and detailed syllabus prepared by the all-India Board of Technical Studies in Engineering of the all-India Council for Technical Education.

P. T. O

(ii) Draft Syllabus for a three year Civil Engineering Degree Course with details of subjects, working time schedules and examinations for each year as prepared by the Chief Engineer (General).

4. The all-India Diploma Courses in Engineering, prepared by the all-India Council for Technical Education, is accepted to be on a park with University standards. The Institution of Engineers (India) have recognised these as equivalent to their Associate Membership Examinations in Sections A & B. The Director of Industrial and Technical Education, Bombay Presidency, has expressed the opinion that they could be used as University Courses. The Delhi University is understood to have already started the Diploma Courses in the Delhi Polytechnic.

5. A separate note is attached on measures to ensure that the shortened 3 year courses do not tend to lower the standards.

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MEASURES TO MAINTAIN THE REQUISITE HIGH STANDARD IN THE SHORTENED 3 YEAR COURSE, AND TO IMPROVE THE PRESENT TEACHING STANDARD WHICH HAS BEEN STEADILY DETERIORATING IN THE LAST FEW YEARS.

In instituting three year courses of study for the Engineering Degrees, special consideration should be given to ensure that the requisite high standards of teaching are not sacrificed. This matter should receive urgent attention even now, because the standard of our engineering colleges in the last few years have been steadily degenerating in spite of the four years of study.

From the following statement of the Guindy Engineering College results for the last three years, it will be seen that the percentage of failed candidates in each year is steadily increasing.

Results of University Examinations in Engineering from Guindy Engineering College in the the three years 1946, 1947 & 1948.

	1946	1947	1948
	FAILURES per cent	FAILURES per cent	FAILURES per cent.
I Year B.E. or F.E. Part I	(8/112) or 6·5%	(74/174) or 42·5%	(123/250) or 49·5%
II Year B.E. or F.E. Part II	(14/109) or 13%	(30/127) or 23·6%	(122/206) or 59%
III Year B.E. or B.E. Part I	(20/90) or 22%	(13/121) or 24%	(65/138) or 47%
IV Year B.E. or B.E. Part II	(2/76) or 3%	(2/95) or 2%	(12/144) or 8·5%

NOTE: Figures in brackets show (Nos. failed/Nos. appeared for examination)

P. T. O

The main reason for this deterioration in teaching standards is to be attributed to the watering down of the qualifications and attainments of the teaching staff, particularly Professors and Heads of Departments. In the past, Guindy College had an unparalled reputation because scrupulous care was bestowed to secure highly qualified and efficient men to occupy these professorial chairs. In recent years, the qualifications prescribed in M.E.S. Rules have been disregarded, and as can be seen from the tabulated statement of the Professors in the Government Engineering Colleges, today the position is that out of a total of ten Professors (and Principals):--

2 have been exempted from the basic qualification of Honours Degree
5 have been appointed under the 9(a)(i) Emergency Rules for the reason that no qualified candidate is available for appointment in accordance with the rules, and
only 3 have been recruited in accordance with the rules prescribed by the Madras M.E.S.

CLASSIFIED LIST OF ALL PROFESSORS (INCLUDING PRINCIPALS) IN GOVERNMENT ENGINEERING COLLEGES.

College	Professors exempted from basic qualification - Honours Degree	Professors under 9 (a) (i)	Professors appointed in accordance with M.E.S. regular rules
Guindy	1. Prof. Paul 2. Prof. Marley	1. Dr. Sukumaran	1. Prof. Krishnaswami
Cocanada	nil	1. Prof. Sitapathy 2. Prof. Natesan 3. Prof. Ramanathan	1. Prof. Sadarangani
Arthur Hope College of Technology	nil	1. Prof. Ramaswami	1. Prof. Viswanath
Total	2	5	3

It is obvious that there is urgent need for stepping up the standards of teaching by improving the quality and quantity of teaching staff and particularly Professors and Heads of Departments.

The following is suggested:

1. The qualifications and attainments of teaching staff may be revised so as to bring them on a par with the recommendations of the all-India Council of Technical Education.
2. Under no circumstances should exemptions from prescribed qualifications be granted in making appointments or promotions to the posts of Professors, Heads of Departments, etc.
3. To attract really competent hands, the salaries of the teaching staff may be revised to bring them in line with the recommendations of the all-India Council of Technical Education.
4. The ratio of staff to students in all the Engineering Colleges be brought to be in conformity with the recommendations of the all-India Council of Technical Education.

Minutes of the Sub-Committee Meeting for the Reduction of Engineering Degree Courses held on 14-6-1948 at 4 P.M. at the Office of the Chief Engineer (General), Chepauk, Madras.

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PRESENT:

1. Sri Rao Bahadur A.R.Venkatachari, Chief Engineer, P.W.D., (General), Madras - CHAIRMAN.
2. Prof. A.Viswanath, Principal, Arthur Hope College of Technology, Coimbatore - SECRETARY.
3. Sri G.Sundaram, Chief Engineer for Electricity, Madras
4. Lt. Col. S. Paul, College of Engineering, Guindy.
5. Dr. Sukumaran, College of Engineering, Guindy.
6. Prof. P.R.Ramaswamy, Arthur Hope College of Technology, Coimbatore.
7. Sri N.S.Krishnaswamy, College of Engineering, Guindy.

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The Sub-Committee appointed in G.O.No.M.S.1056 Edn., dated 30-4-1948, went into the question of the Draft Syllabus and details of the Three Year Course in the three basic branches of Civil, Mechanical and Electrical Engineering. The Draft Syllabus drawn up by the Chairman for all these courses were discussed and broadly accepted. It was resolved that the work of finalising the syllabuses on these lines should be left to the Board of Studies in Engineering.

2. During the discussions, Lt. Col. Paul and Dr. Sukumaran expressed their doubts whether these courses of Engineering Studies can be reduced to three years without impairing efficiency, while the 5 other members agreed that the three year shortened courses are possible.

3. The Committee felt that simultaneous with the reduction of the Engineering Courses to three years, the number of working days per year should be increased from 160 to 180.

4. The Committee further stressed that in view of the intensive nature of the courses, it is essential that the staff should be adequately strengthened and their remuneration increased to a level sufficient to attract first-class men. It is very important that money is spent on securing the right class of teachers in view of the industrial and engineering progress of the country being dependent on the large output of competent engineers from the Colleges.

5. The Sub-Committee also recommends that the new three year courses and syllabuses should be brought into force starting with the batch of students being admitted this year (1948).

6. In view of the reduction of the 4 year course to 3 years, the Committee feels that it should be possible to increase the number of admissions thus increasing the output of engineers.

Secretary.

To the Chairman and all members
Copy to the Secretary, Education & P.H. Dept.
" to the Director of Public Instruction, Madras

SPECIAL NOTE SUBMITTED AS DESIRED BY THE HON'BLE MINISTER FOR EDUCATION AND THE DIRECTOR OF PUBLIC INSTRUCTION WITH REFERENCE TO PARA 4 OF THE RECOMMENDATION OF THE SCIENTIFIC MAN POWER COMMITTEE.

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SUB:- Shift system at the Engineering College, Guindy.

I have discussed the working of the shift system with all the heads of departments of this College in all its details. The Scientific Man Power Committee have recommended the shift system in order to increase the output of Engineers to meet the anticipated demands of the Services. As this matter is of prime importance and as the present number of Engineering Colleges in the Presidency cannot meet this demand, the only solution would be to increase the admissions in the Engineering Colleges by any appreciable number. The Engineering Colleges in the Presidency are working to their full capacity and increase in the number of admissions in each College is not possible unless the shift system is introduced. The only College in the Presidency which can adopt this shift system, because of the advantageous position it has with respect to buildings, equipment, hostel etc., is the Engineering College at Guindy. Under ordinary circumstances, it would have been possible to double the number of admissions and to work an independant second shift. The lecture classes would have to be duplicated asit was done last year, when the students of the Anantapur Engineering College were located at Guindy. Separate laboratory classes, workshop classes, drawing classes etc., would, however, have to be held and I propose to do this by running these classes in shifts, and working during the time that the normal classes are off from the respective departments. The exact details of the time-table will have to be drawn up and gone into thoroughly to see that this shift system functions without any hitch.

As pointed out before, the extra number that could be admitted in this College would be 100, making it a complete shift system, but owing to orders received from Government asking this College to accommodate 75 students of the Coimbatore Engineering College, it would not be possible to take the full 100. If the Government can reconsider the question of keeping the Coimbatore College boys at Coimbatore, it would be possible to increase the admissions into the Guindy College by 100, and I would earnestly request the Govennment to reconsider this, as only in that case, would the shift system materially increase the number of admissions and therefore increase the output of Engineers in this Province. If, however, this is not possible, I suggest that 55 more students may be admitted into this College this year and the practical classes arranged into shifts . The number 55 is suggested as 130 boys of the Anantapur Engineering College, who were at Guindy during the last two years would be going away to Anantapur, and 130 minus 75 = 55 would make hostel and other accommodation feasible. The increase of admissions by this number would make a 50% increase in the number of admissions. In the succeeding years, it would be possible to increase the admissions by 100, instead of 55 and work the shift system. The abolition of the Licentiate course in the Guindy College and the transferance of the Overseer classes to Polytechnics would ease the situation considerably and make it possible to practically double the admissions in each of the succeeding years. It is, however, taken for granted that the

(34)

the staff and other technical personnel required for working the shift system would be increased not according to the increase in numbers, but commensurate in some way to the work that has to be turned out. I give below tentative financial implications for increasing the admissions in July 1948 by 55 students. It is taken for granted that the necessary staff for the 75 Coimbatore College students will be sanctioned in the usual course.

FINANCIAL IMPLICATIONS.

CIVIL DEPARTMENT:	Two Assistant Instructors.	Rs.460/-	per men sem.
CHEMISTRY:	One Assistant Lecturer.	150/-	"
	One Demonstrator.	100/-	"
	One Attender.	48/-	"
PHYSICS:	One Assistant Lecturer.	150/-	"
	One Demonstrator.	100/-	"
	One Attender.	48/-	"
MECHANICAL:	Two Assistant Instructors.	460/-	"
ELECTRICAL:	NIL.		
WORKSHOPS:	One Junior Workshop Instructor. (Assistant Instructor).	230/-	"
SURVEY:	NIL.		

TOTAL for one month. Rs.1746/-.

TOTAL for one year. 1746 x 12 = Rs.20952.

Income from students: @ Rs.216/- for 55 students.
= Rs.11,880/-.

Net cost to Government. Rs.9072/-.

Cost per student: About Rs.165/-.

It would thus be seen that the cost per student is very low and if the shift system is introduced completely for 4 years, the cost per student would be considerably reduced as the same equipment, same drawing halls etc., will be utilised for instructional purposes. As an emergent measure, this would be the only solution to meet the unexpected demand for Engineers from the Services. I request that the above points may meet with your favourable and sympathetic consideration and that orders may be passed to increase the number of seats in the Guindy College by 55.

A. Paul
14/6/48

College of Engineering,
Guindy, Madras-15.
Dated: 14th June 1948.

PROFESSOR-IN-CHARGE.

H.M.(Education).

(35)

Ref: Meeting of the Standing Advisory Board of Technical Education - Note from the Secretary, College of Engineering, Guindy, ABTE. No. 13/48 dated 7th June 1948.

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I shall not be able to be present at the above meeting since I shallbe away in Bezwada.

11/6/1948.

-2-

the staff and other technical personnel required for working the shift system would be increased not according to the increase in numbers, but commensurate in some way to the work that has to be turned out. I give below tentative financial implications for increasing the admissions in July 1948 by 55 students. It is taken for granted that the necessary staff for the 75 Coimbatore College students will be sanctioned in the usual course.

FINANCIAL IMPLICATIONS.

CIVIL DEPARTMENT: Two Assistant Instructors. Rs.480/- per mensem.

CHEMISTRY: One Assistant Lecturer. 150/- "
One Demonstrator. 100/- "
One Attender. 48/- "

PHYSICS: One Assistant Lecturer. 150/- "
One Demonstrator. 100/- "
One Attender. 48/- "

MECHANICAL: Two Assistant Instructors. 480/- "

ELECTRICAL: NIL.

WORKSHOPS: One Junior Workshop Instructor. (Assistant Instructor). 250/- "

SURVEY: NIL.

TOTAL for one month. Rs.1748/-.

TOTAL for one year. 1748 x 12 = Rs.20952.

Income from students: @ Rs.216/- for 55 students.
= Rs.11,880/-.

Net cost to Government. Rs.9072/-.

Cost per student: About Rs.165/-.

It would thus be seen that the cost per student is very low and if the shift system is introduced completely for a years, the cost per student would be considerably reduced as the same equipment, same drawing halls etc., will be utilised for instructional purposes. As an emergent measure, this would be the only solution to meet the unexpected demand for Engineers from the Services. I request that the above points may meet with your favourable and sympathetic consideration and that orders may be passed to increase the number of seats in the Guindy College by 55.

PROFESSOR-IN-CHARGE.

College of Engineering,
Guindy, Madras-25.
Dated: 14th June 1948.

Secy to CM to be filed. (R.O)

KPH 29/7
Pl to my Edn.

College of Engineering, Guindy,
Madras-15, Dated 27th July 1948.

SECRETARY, EDN. AND P.H. DEPT. GOVERNMENT OF MADRAS 31 JUL 1948

ASST. SECRETARY TO GOVERNMENT EDUCATION AND PUBLIC HEALTH DEPT. 31 JUL 1948

Dear Sir,

Sub: Minutes of the 2nd Meeting of the Standing Advisory Board for Technical Education.

I am sending herewith a copy of the Minutes and Summary of Proceedings of the meeting of the Standing Advisory Board for Technical Education held on 15th June 1948, for your kind reference.

57094

Yours sincerely,

A. Paul
27/7/48

Hon'ble Sri T.S.Avinashilingam Chettiar,
Minister for Education, & Chairman,
Fort St.George,
MADRAS.

Encl: 1. Minutes.
2. Summary of Proceedings.

Abstract

G.O.No.Ms.2783 Edn. dated 6-11-48

Techl. Edn. - Standing Advisory Bd. for Techl. Edn. - Proceedings of meeting on 15-6-48 - Papers recdd.

(37)

MINUTES OF THE MEETING OF THE STANDING ADVISORY BOARD FOR TECHNICAL EDUCATION HELD ON 15TH JUNE 1948 AT THE COUNCIL CHAMBER, FORT ST.GEORGE, MADRAS.

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The second meeting of the Standing Advisory Board for Technical Education was held at the Council Chamber at 2-30 P.M., on Tuesday the 15th June 1948. The following members were present.

1. Sri T.S.Avinashilingam Chettiar, Hon'ble Minister for Education. CHAIRMAN.
2. Sri N.Govindaraja Iyengar, Chief Engineer (Special).
3. Sri A.R.Venkatachari, Chief Engineer (General).
4. Sri G.Sundaram, Chief Engineer (Electricity).
5. Mr.W.H.Turner, Chief Engineer (Highways).
6. Prof.A.Viswanath, Principal, Arthur Hope College of Technology, Coimbatore.
7. Mr.V.H.Sadarangani, Principal, College of Engineering, Cocanada.
8. Sri T.M.S.Mani, Director of Industries.
9. Sri S.Govindarajulu, representing the Madras University.
10. Dr.K.C.Chakko, representing the Annamalai University.
11. Sri K.K.Nambiar, Corporation Engineer, Madras.
12. Sri Subramanyam, M. & S.M. Railway.
13. Chief Engineer, S.I.Ry.
14. Sri N.S.Varadachari, M.L.A.
15. Sri N.Ranga Reddi, M.L.C.
16. Sri Pallam Raju, M.L.A.
17. Lt.Col.S.Paul, Principal, College of Engineering, Guindy. SECRETARY.

Lt.Col.S.L.Bhatia, Surgeon General with the Government, Dr.R.M.Mathew, Director of Public Health, and Mr.Coorey, I.C.S., Secretary, Education and Public Health Department, representing the Hon'ble Minister for Public Health were present by invitation.

The Hon'ble Minister for Education welcoming the members of the Board and others made a survey of the progress of technical education, collegiate education, secondary education and elementary education, that has been made in this Province during the last one year. The expansion of basic education in the Province and the bifurcation courses in the school stage was particularly brought to their notice. The contemplated opening of the Electro Chemical Institute at Karaikudi and the Textile Research Institute at Coimbatore were, he remarked, important landmarks of the Industrial advancement of the Province.

At the suggestion of one of the members, item (2) of the Agenda, viz., the shortening of the duration of the engineering courses from 4 to 3 years, was taken up first. After a lively discussion in which most of the members took part, the following resolution was adopted.

" Consequent on the decision arrived at the meeting of the Standing Advisory Board for Technical Education on the 15th June 1948 to reduce the duration of the Engineering courses to 3 years instead of the present 4 years, (subject to the approval of the University), a Committee consisting of the following members will go into the questions detailed below and submit a report to Government:-

1.Sri N.Govindaraja Iyengar, Chief Engineer (Special). CHAIRMAN.

2.Sri A.R.Venkatachari, Chief Engineer (General).

3.Sri G.Sundaram, Chief Engineer (Electricity). (33)
4.The Vice Chancellor, Madras University.
5.The Director of Public Instruction.
6.Dr.K.C.Chakko, Principal, Annamalai University Engineering College.
7.Lt.Col.S.Paul, Principal, College of Engineering, Guindy.
8.Prof.A.Viswanath, Principal, A.H.College of Technology, Coimbatore.
9.Mr.V.H.Sadarangani, Principal, College of Engineering, Cocanada.

(a) For suggesting measures to increase the efficiency of the Engineering Colleges in the Presidency with reference to

(i) new and additional staff.
(ii) equipment and other scientific apparatus.
(iii) any other matter which may be conducive to efficiency.

(b) For suggesting standards for admission of students to the Engineering Colleges and thereby improving the human material.

(c) For examining and reporting the financial effects of these proposals, and

(d) For suggesting any other measure that will improve efficiency. "

Item (2) of the Agenda, viz., opening of a degree course in Public Health Engineering at the College of Engineering, Guindy was then taken up. There was divided opinion about the feasibility of opening the course. In view of the previous resolution advocating the shortening of the course from 4 to 3 year no agreement could be arrived at, as to whether a course in Public Health Engineering should be a basic course like the Civil, Mechanical and Electrical Engineering courses, or whether it should be a post-graduate course after the three year basic course. The Hon'ble Minister summing up said: " It would be better to find out the needs from the relative Department and in any case, he thought that as there was already a big problem of shortening the duration of the courses, it was not possible to open new courses at this stage. But if information can be obtained from the relating Department that there was need for Public Health Engineers, the course can be started even as a post-graduate course this year. If, however, it was necessary to run a basic Public Health Engineering course like Civil, Mechanical and Electrical, then it would not be possible to start it just now before investigating all the details."

Item (3) of the Agenda, viz., Inclusion of anti-erosion measures in the syllabus of the engineering courses, was then taken up. The Board was of the opinion, that as this was a matter of detail in the syllabus, it may be referred to the respective Boards of Studies in Engineering of the various Universities for inclusion in the syllabus.

At the conclusion of the meeting, the Hon'ble Minister had a discussion with the members of the Sub Committee for going into the details of the shortening of the course from 4 to 3 years.

S. Paul
SECRETARY.

SD/-T.S.AVINASHILINGAM.
CHAIRMAN.

MADRAS,
6-7-1948.

SUMMARY OF THE PROCEEDINGS OF THE MEETING OF THE STANDING ADVISORY BOARD FOR TECHNICAL EDUCATION HELD ON THE 15TH JUNE 1948, AT THE COUNCIL CHAMBER, FORT ST. GEORGE, MADRAS.

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The second meeting of the Standing Advisory Board for Technical Education was held at the Council Chamber at 2-30 P.M. on Tuesday the 15th June 1948. The following members were present:

1. Sri T.S.Avinashilingam Chettiar, Hon'ble Minister for Education. CHAIRMAN.
2. Sri N.Govindaraja Iyengar, Chief Engineer (Special).
3. Sri A.R.Venkatachari, Chief Engineer (General).
4. Sri G.Sundaram, Chief Engineer (Electricity).
5. Mr.W.H.Turner, Chief Engineer (Highways).
6. Prof.A.Viswanath, Principal, A.H.College of Technology, Coimbatore.
7. Mr.V.H.Sadarangani, Principal, College of Engineering, Cocanada.
8. Sri T.M.S.Mani, Director of Industries.
9. Sri S.Govindarajulu, representing the Madras University.
10. Dr.K.C.Chakko, representing the Annamalai University.
11. Sri K.K.Nambiar, Corporation Engineer, Madras.
12. Sri Subramanyam, M. & S.M.Railway.
13. Chief Engineer, S.I.Ry.
14. Sri N.S.Varadachari, M.L.A.
15. Sri N.Ranga Reddi, M.L.C.
16. Sri Pallam Raju, M.L.A.
17. Lt.Col.S.Paul, Principal, College of Engineering, Guindy. SECRETARY.

Lt.Col.S.L.Bhatia, Surgeon General with the Government, Dr.R.M.Mathew, Director of Public Health, and Mr.Coorey, I.C.S., Secretary, Education and Public Health Department representing the Hon'ble Minister for Public Health were present by invitation.

The Hon'ble Minister for Education in welcoming the members of the Board and others traced the development of technical education, collegiate education, elementary education and secondary school education in the Province and specially brought to the notice of the members the rapid expansion of basic education in the Province and the bifurcation courses adopted in the school curriculum. The proposed opening of the Electro Chemical Research Institute at Karaikudi and the Textile Research Institute at Coimbatore was also brought to the notice of the members. In winding up his introductory remarks, the Hon'ble Minister referred to the items of the Agenda and said that he would be glad to have the suggestions of the members.

At the suggestion of Mr. Sadarangani, item (2) of the agenda, viz., the shortening of the courses from 4 years to 3 years was taken up first for discussion. With the permission of the Hon'ble Minister, Lt.Col.S.Paul introduced the subject with reference to the special note circulated by him previous to the meeting.

In introducing the subject, Lt.Col.Paul stressed the objections that he had raised in the note and said that the shortening of the course from 4 years to 3 years would be a welcome change now if an M.Sc. course by examination was introduced after 3 years B.E. course. His objections to shortening of the course was based on the fact that the 4 year course has satisfactorily worked over a quarter of a century and had proved

proved its worth by turning out brilliant students who had acquitted themselves in various posts to which they had been appointed. He, pointed out the record set up by the engineering graduates in the All-India Competetive examinations which had given India the graduates of this college to man the various services from north to south and east to west. If now the courses were shortened, he was afraid that it might affect the recruitment to All India Services, but the M.Sc. course by exmmination suggested by the Chief Engineers was a point in favour of the shortening of the course.

Sri A.R.Venkatachari, Chief Engineer (General), Chairman of the Special Committee appointed to draw up a suitable syllabus for shortening the course, explained that the Sub Committee had examined this question at a meeting on the previous day, i.e., the 14th June 1948. The members of this Sub Committee consisted of the following:-

1. Sri A.R.Venkatachari, Chief Engineer (General).
2. Sri G.Sundaram, Chief Engineer (Electricity).
3. Lt.Col.S.Paul, Principal, College of Engineering, Guindy.
4. Dr.K.Sukumaran, Professor of Electrical Engineering, College of Engineering, Guindy.
5. Mr.P.R.Ramaswamy, Professor of Civil Engineering, A.H. College of Technology, Coimbatore.
6. Prof.A.Viswanath, Principal, A.H.College of Technology, Coimbatore. SECRETARY.

Mr.Venkatachari explained the views of the Sub Committee and said that they were of the opinion that the shortening of the course from 4 years to 3 years was desirable and necessary on account of the large demand of engineers from various services during the next 5 years. He further pointed out that he had prepared a syllabus which could be satisfactorily worked within three years of 180 working days. He said that the pedestrian type of Engineer did not require to be trained in the manner in which they were being trained at the present moment at the Engineering College. If the scheme for shortening the cour was adopted, it was pointed out that the colleges would increase the outturn by 33⅓% and as the third and fourth year would finish 3 years after the scheme was introduced, one year's admission of students in the various colleges, numbering about 365 would be made available to the services immediately. No apprehension was felt by him about the All India Competetive Services, as he was of the opinion that only 5% of the total output of the college would apply for such services and the postgraduate courses contemplated along with the three years shortened course would prepare such students for these competetive examinations. The syllabus, he said, could be introduced immediately from the academical year 1948-49, as all details had been gone into thoroughly by him and the Sub Committee.

There was a lively discussion over this item of the agenda by all the members present and the majority were in favour of reducing the course from 4 years to 3 years.

The Hon'ble Minister for Education winding up the discussion said: " I am very glad that unlike some other meetings, at this meeting, we have come to some definite conclusion. Let us make an attempt to introduce the 3 year course even this year. I shall certainly take this matter over with the Universities concerned. There may be some delay. After all, the Universities are our own. In the past, they have always cooperated with us and this time also, I feel that they will do so." He also referred to the admission of students and said that he was anxious that our colleges should be of top effi-

efficiency. Consequent on the reduction of the course to 3 years, the Minister envisaged some saving owing to the possible reduction in staff and said that the full implications of the scheme must be looked into without taking it piece-meal. A Committee consisting of the following was appointed to go into all the points, such as admissions, staff, financial implications and to give a full picture of the scheme to the Government as quickly as possible. The resolution adopted by the Board as read as follows:

" Consequent on the decision arrived at the meeting of the Standing Advisory Board for Technical Education on the 15th June 1948 to reduce the duration of the Engineering courses to 3 years instead of the present 4 years (subject to the approval of the University), a Committee consisting of the following members will go into the items detailed below and submit a report to Government.

1. Sri N.Govindaraja Iyengar, Chief Engineer(Special). CHAIRMAN.
2. Sri A.R.Venkatachari, Chief Engineer (General).
3. Sri G.Sundaram, Chief Engineer(Electricity).
4. The Vice Chancellor, Madras University.
5. The Director of Public Instruction.
6. Dr.K.C.Chakko, Principal, Annamalai University Engineering College.
7. Lt.Col.S.Paul, Principal, College of Engineering, Guindy.
8. Prof.A.Viswanath, Principal, A.H.College of Technology, Coimbatore.
9. Sri V.H.Sadarangani, Principal, College of Engineering, Cocanada.

(a) For suggesting measures to increase the efficiency of the Engineering Colleges in the Presidency with reference to:

(i) new and additional staff.
(ii) equipment and other scientific apparatus.
(iii) any other matter which may be conducive to efficiency.

(b) For suggesting standards for admission of students to the Engineering Colleges and thereby improving the human material.

(c) For examining and reporting on the financial effects of these proposals, and

(d) For suggesting any other measure that will improve efficiency.

Item (1) of the Agenda, viz., Opening of a degree course in Public Health Engineering was then taken up. The Hon'ble Minister for Education invited the Surgeon General to introduce the subject.

The Surgeon General, in his opening remarks mentioned the need for a large number of trained Public Health Engineers. He particularly brought to the notice of the members that in countries like U.S.A., a large number of Public Health Engineers were employed to combat Malaria and prevent diseases and to look after environmental hygiene, water-supply, drainage etc. If the estimate of the Bhore Committee was taken for granted, 25 Public Health Engineers and 125 Assistant Public Health Engineers would be required for the Presidency. According to the Note, it was the intention to start a course in Public Health Engineering immediately, the first batch to start

start from the third year students. After hearing the discussion about the shortening of the engineering courses from 4 to 3 years, it was doubtful whether the original proposal could be put into effect. He stressed the need of having first class teachers for any course and research which was conducive to the development of any branch of scientific study. He further assured the members as Surgeon General that with the co-operation of the Public Health Department every effort would be made to give all possible help at the King Institute and the Madras Medical College in order to run this course satisfactorily at the Engineering College, Guindy.

The Director of Public Health following the Surgeon General briefly outlined how the syllabus had been finally formulated and submitted to the Board. He was, however, of the opinion that after hearing the discussion about the reduction of the basic course from 4 years to 3 years, whether it would not be advisable to have a specialised course in Public Health Engineering after the completion of the basic course for a duration of 9 to 12 months. He also stressed the need for recruiting Professors and Assistant Professors and urged that the system followed in the All India Institute of Hygiene was worthy of being copied.

Most of the members took part in the discussion and it was elicited in the discussion that as the Government were not ready to push through the Rs.55/- crore scheme with regard to Water-supply, Drainage etc., whether there was any need for this type of Public Health Engineers. Opinion was divided as to whether it should be a basic course in Public Health Engineering, or whether it should be a post-graduate course of one year after the basic course in Civil Engineering.

The Chief Engineer (General) who spoke last stressed the necessity for knowing the definite programme of the Government with regard to Public Health, water-supply, drainage and ascertainmg the number of Public Health Engineers that would be required in the light of the programme of the Government. Otherwise, he stated that after a certain period, when the required number of Engineers had been turned out there would not be enough jobs for Public Health Engineers and there would be unemployment.

The Hon'ble Minister agreeing with the Chief Engineer suggested that it would be better to find out the needs from the relative Department and in any case he thought that as there was already a big problem of shortening the duration of the courses, it was not possible to open new courses at this stage. But if information could be obtained from the relative department that there was need for Public Health Engineers, the course can be started even as a post-graduate course this year. If, however, it was necessary to run a basic Public Health Engineering course like Civil, Mechanical and Electrical, then it would not be possible to start it just now before investigating all the details.

Item (3) of the Agenda, viz., Inclusion of the subject "anti erosion measures" in the curriculum of studies in the Engineering College was considered. It was the opinion of

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of the members that as it related to a detail of the syllabus, the matter may be referred to the Board of Studies in Engineering of the various Universities.

The Hon'ble Minister for Education, winding up the Proceedings thanked the members for being present at the meeting and for their valuable suggestions which had helped him to come to certain definite conclusions.

The meeting then terminated.

After the termination of the meeting, the Hon'ble Minister had a few minutes discussion with the members of the Special Committee to consider the details of the shortening of the course.

MADRAS,
6-7-1948.

SECRETARY.

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