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ANNUAL REPORT 1964-65

MADRAS

ANNUAL REPORT

1964-65

INDIAN INSTITUTE OF TECHNOLOGY

MADRAS

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SIXTH ANNUAL REPORT

1964 — 65

GENERAL

1. Highlights of the Year

The sixth year of the Institute has been noteworthy for the remarkable and varied activities in the scholastic and other spheres of the Institute. The following were some of the important highlights of the year :

(i) Maiden visit to the Institute by the Visitor of the Institute, Dr. Sarvepalli Radhakrishnan, President of the Republic of India to deliver the first Convocation Address.

(ii) Holding of the First and Second Convocations of the Institute.

(iii) First batch of research scholars qualifying for the Ph.D. Degree in Mathematics and Physics.

(iv) First batch of students qualifying for the M.Sc. Degree in Mathematics and Physics.

(v) Establishment of the Central School in the campus of the Institute.

(vi) Collaboration of the Institute with other Institutes in organising Seminars at the Institute.

(vii) Inter-I.I.T. Meet at Madras.

(viii) Participation of the Institute in the Inter-University Youth Festival at New Delhi.

(ix) Completion and commissioning of a workshop for Chemical Engineering and also two more hostel buildings, viz., Ganga and Jamuna.

(*a*) *Convocations* :

The First Convocation of the Institute was held on the 11th July 1964 for conferring the B.Tech. Degree and the M.Sc. Degree on the first batch of the students. Dr. S. Radhakrishnan presided over the convocation and delivered the Convocation Address.

The number of candidates who took their Degrees in person and *in absentia* was as follows :

	In person	*In absentia*	*Total*
B.Tech. Degree ..	66	26	92
M.Sc. Degree ..	14	1	15

The Second Convocation was held on the 3rd April 1965 to confer the Ph.D. Degree on the first set of research scholars and the B.Tech. Degree on the students of the second batch who underwent the accelerated Course. Shri M. C. Chagla, Union Minister for Education, delivered the Convocation Address.

The number of candidates who were awarded the Degree in person and *in absentia* was as follows :

	In person	*In absentia*	*Total*
B.Tech. Degree ..	64	51	115
Ph.D. Degree ..	3	..	3

The alumni of the Institute who took their degree in person at the two Convocations were the guests of the Institute during their stay at Madras. The Senate played hosts to the new graduates and scholars at Dinner on Convocation day. Dr. A. L. Mudaliar, Chairman of the Board of Governors, and Prof. B. Sengupto, Director of the Institute addressed the graduates and scholars at the end of the dinner on both occasions.

Detailed reports about the two Convocations are given in Appendices I and I A.

(b) Inter-I.I.T. Meet :

The third Inter-I.I.T. Sports and Cultural Meet was held at the Institute with great eclat in December 1964. The Institute Gymkhana was in charge of organising and conducting the Meet. An outdoor stadium with accommodation for about 10,000 persons was constructed within record time by the Engineering Unit of the Institute for the Meet.

The Meet was inaugurated on the 28th December, 1964 by Shri Mansur Ali Khan, better known as the Nawab of Pataudi.

All the Indian Institutes of Technology took part in the different events in athletics, games, debates and histrionics.

At the Meet, our Institute considerably improved upon its previous performances, securing 86 points against 35 of last year, and finished third among the five Institutes. The Indian Institute of Technology, Kharagpur bagged the athletic and overall championship for the third year in succession, securing 126 points. Our Institute put up a fine show by sweeping the 800, 1,500 and 5,000 Metres Races as also the Broad jump, Hop Step and Jump, 400 × 400 metres relay, Football and Volleyball.

The entertainments put up by the various contingents of the Institute were highly appreciated by the large audience present for each entertainment. Particular mention may be made of the varied programmes in music, vocal and instrumental, short skits and plays, the radio jumble, Punjabi vocals and mimicry. A good attraction at the Meet was the putting up of a transmitting station, labelled "Radio I.I.T." by two students of the Institute which broadcast on a frequency of 300m.

To give an opportunity to the students to display their engineering skill and talents, a Science Fair was held at the time of the Meet. Judged by the number and variety of items put up and their standards, the Fair was a good success.

The Inter-I.I.T. Meet concluded on the 31st December 1964 with the prize distribution function presided over by Dr. A. L. Mudaliar. This was followed by a dinner given by

the Institute and a variety entertainment in which all Institutes participated.

The results of the Meet are given in Appendix II.

(c) *Central School* :

The establishment of the Central School in the campus of the Institute was another important event during the year. The School is one of the 82 Higher Secondary Schools established by the Government of India and is affiliated to the Central Board of Secondary Education, New Delhi. It started functioning on 20th July 1964 with standards VI to IX. Standard X was added in June 1965 and Standard XI, will come into being in June 1966. Dr. A. Lakshmanaswami Mudaliar, Vice-Chancellor of the Madras University, declared open the new School building in the campus of the Institute on 20th January 1965.

The affairs of the School are managed by a local Committee consisting of :

1. Prof. B. Sengupto, B.Sc. (Engg.), M.I., Mech.E., M.I.E. (Ind.),
   Director,
   Indian Institute of Technology,
   Madras-36. (*Chairman*)

2. Prof. R. K. Gupta,
   Professor of Industrial Management,
   Department of Humanities,
   Indian Institute of Technology,
   Madras-36.

3. Prof. R. G. Narayanamurthi,
   Head of the Department of Mechanical Engineering,
   Indian Institute of Technology,
   Madras-36.

4. Rev. Father L. D. Murphy,
   C/o. the Fathers' Lodge,
   Loyola College,
   Madras-6.

5. Shri Hussain Aga, I.A. & A.S.,
Accountant General,
Madras-18.

6. Shri C. L. M. Vasagam, I.A.S.,
Collector of Madras,
Madras-1.

7. Shri R. Perumal, B.A. (Hons.), B.T.,
Divisional Inspector of Schools,
Madras Division,
Office of the Director of Public Instruction,
Madras-6.

8. Shri M. K. Natarajan, M.A.,L.T., Dip. Geo., Cert. Lib.,
Principal,
Central School, Indian Institute of Technology,
Madras-36. (*Secretary*)

9. Shri R. Rama, M.A., M.Ed.,
Post Graduate Teacher in History,
Central School, I. I. T.,
Madras-36.

2. (*a*) THE BOARD OF GOVERNORS

The Board of Governors of the Institute met four times during the year. The following members constituted the Board :

Chairman

1. Dr. A. L. Mudaliar, Vice-Chancellor,
University of Madras.

Members

2. Prof. B. Sengupto, Director, Indian Institute of Tchnology, Madras.

3. Shri Mir Akbar Ali Khan, Member of Parliament,
Andhra Pradesh.

4. Shri K. Sreenivasan, Director,
South India Textile Research Association, Coimbatore.
5. Shri I. M. Magdum, Director of Technical Education, Government of Mysore, Bangalore (upto 6-10-1964).
6. Shri B. L. Shanthamallappa, Director of Technical Education, Government of Mysore, Bangalore. (From 7-10-1964).
7. Shri S. Rajaraman, Director of Technical Education, Government of Kerala, Trivandrum.
8. Shri P. M. Reddy, General Manager,
Hindusthan Aeronautics Ltd., Bangalore.
9. Dr. Y. Nayudamma, Director,
Central Leather Research Institute, Madras.
10. Shri A. Abdul Rahim, M.L.A., Correspondent,
T. K. M. Engineering College, Quilon.
11. Dr. Rajah Muthiah Chettiar, Madras.
12. Dr. E. G. Ramachandran,
Professor and Head of the Department of Metallurgy, Indian Institute of Technology, Madras.
13. Dr. M. V. C. Sastry,
Professor and Head of the Department of Chemistry, Indian Institute of Technology, Madras.

Secretary

Shri R. Natarajan, I.A.S.,
Registrar (upto 4-4-1965).

Prof. C. V. Sethunathan,
Registrar (from 5-4-1965).

2. (*b*) THE SENATE

The Senate met ten times during the year.

The following members constituted the Senate.

Chairman

1. Prof. B. Sengupto, Director.

Members

2. Dr. P. L. Bhatnagar,
   Head of the Department of Applied Mathematics,
   Indian Institute of Science,
   Bangalore-12.

3. Dr. G. S. Laddha,
   Director,
   A. C. College of Technology,
   Madras-25.

4. Prof. T. Balakrishnan Nayar,
   Principal,
   Tagore Arts College,
   Pondicherry.

5. Prof. R. G. Narayanamurthy,
   Head of the Department of Mechanical Engineering.

6. Dr. E. G. Ramachandran,
   Head of the Department of Metallurgy.

7. Prof. S. Sampath,
   Head of the Department of Electrical Engineering and
   Chairman, Council of Wardens.

8. Dr. P. C. Varghese,
   Head of the Department of Civil Engineering.

9. Prof. R. Krishnamurthi,
   Head of the Department of Humanities.

10. Dr. S. Ramaseshan,
    Head of the Department of Physics (till 2-9-1964).

11. Dr. C. Ramasastri,
    Assistant Professor of Physics,
    In-charge, Department of Physics (from 3-9-1964).

12. Dr. D. Venkateswarlu,
    Head of the Department of Chemical Engineering.

13. Prof. R. K. Gupta,
Professor, Department of Humanities.

14. Dr. S. D. Nigam,
Head of the Department of Mathematics.

15. Dr. M. V. C. Sastri,
Head of the Department of Chemistry.

16. Dr. S. R. Valluri,
Head of the Department of Aeronautics and Applied Mechanics.

17. Dr. W. Koch,
Professor, Department of Physics.

18. Dr. G. Stahl,
Professor, Department of Mechanical Engineering.

19. Dr. W. Scheer,
Professor, Department of Mechanical Engineering.

20. Dr. N. Klein,
Professor, Department of Humanities.

21. Dr. G. Rouve,
Professor, Department of Civil Engineering.

22. Dr. H. Heitland,
Professor, Department of Mechanical Engineering.

23. Dr. W. Lutz,
Professor, Department of Mechanical Engineering.

24. Dr. E. Hohmann,
Professor, Department of Chemical Engineering (from 6-3-1965).

25. Prof. F. W. Lohr,
Professor, Department of Mechanical Engineering (from 2-3-1965).

26. Dr. H. W. Meyer,
Professor, Department of Electrical Engineering (from 9-4-1965).

27. Dr. R. J. H. Bisanz,
Professor, Department of Chemical Engineering (from 29-5-1965).

Secretary

Shri R. Natarajan, I.A.S.,
Registrar (upto 4-4-1965).

Prof. C. V. Sethunathan,
Registrar (from 5-4-1965).

3. Admissions

205 students were admitted into the I year of the 5-year B.Tech. Degree Course from among those who qualified themselves at the Joint Entrance Examination for being interviewed.

Details showing the number of candidates who appeared for the Joint Entrance Examination, the number joined and other particulars are given in Appendix III.

Admissions to the 3-year B.Tech. Degree Course and M.Sc. Degree Course were made on the basis of the merits of the candidates in the entrance examinations held by the Institute.

Students were admitted to the M.Tech. Degree Course in the different branches on the basis of their previous academic records and performance at the interviews.

The strength of students on rolls at the commencement of the year as well as their strength in the previous year is given in Appendix IV.

4. Examinations

Out of 122 students in the final year class of the 5-year B.Tech. Degree Course, 115 students qualified themselves for the B.Tech. Degree, one student being placed in I class with Distinction, 75 in I class and 39 in II class.

The results of the other courses including post-graduate courses were encouraging. A statement showing the results of the examinations is given in Appendix V.

5. SCHOLARSHIPS AND PRIZES

(a) *Scholarships*

Scholarships and free studentships were awarded to the students by the Institute as noted below :

Course	Merit Scholar-ships	Merit-cum Means scholar-ships	Free-student-ships
5-year B.Tech.	63	144	37
3-year B.Tech.	11	36	17
M.Sc.	4	6	5
M.Tech.	60	..	..
Ph.D.	19	..	..

The expenditure incurred by the Institute on scholarships was Rs. 4,22,983.92.

The Government of India, the different State Governments, Social Welfare Boards, Harijan Welfare Departments in the States, the Atomic Energy Commission and other bodies sanctioned the payment of scholarships and loans to the students of this Institute as usual.

Needy students were given financial assistance from the Students' Aid Fund of the Institute.

Particulars of scholarships and loans and the number of students benefited are listed in Appendix XI.

(b) *Prizes*

(i) The Institute is grateful to His Excellency the Governor of Madras for his kind gesture in enhancing the endowment for the 'Governor's Prize' from Rs. 500 to Rs. 1,500. The amount has been invested in Fixed Deposit with the State Bank of India with an yield of an annual interest of Rs. 105.

(ii) The Board of Governors accepted the offer of Messrs. Siemens Engineering and Manufacturing Company of India Ltd., Madras, to place at the disposal of the Institute a

sum of Rs. 250 annually for the award of two prizes called the 'Siemens Prize' (1) for the Electrical Branch (Hc or Lc) of the 5-year B.Tech. Degree Course and (2) for the Electrical Branch of the M.Tech. Degree Course.

(iii) The Board of Governors decided that Merit Prizes in the form of Bronze Medals and National Savings Certificates of the value of Rs. 75 each be awarded to the students who obtained the first rank in each branch of study and were eligible for the conferment of the M.Tech. Degree.

(iv) The following prizes were awarded by the Institute at the two convocations :

The President's Prize	
(Bronze Medallion and National Savings Certificate of the value of Rs. 150)	To the best student who qualified himself for the conferment of the B.Tech. Degree after undergoing the course for five years.
The Governor's Prize	
(Silver Medal of the value of Rs. 25)	To the best allround student eligible for the conferment of the B.Tech. Degree.
Merit Prizes	
(Bronze Medal and National Savings Certificates of the value of Rs. 75)	To the students who obtained the first rank in each branch of study and qualified for the award of the Degree of B.Tech. (5-year course) and M.Sc.
Siemens Prize	
(Bronze Medal and National Savings Certificate of the value of Rs. 75)	To the best student in Electrical Engineering Branch eligible for the conferment of the B.Tech. Degree after completing the 5-year course.

The Institute awarded as before Merit Prizes to the students in the different disciplines of study, the value of the First Prize being Rs. 50 and that of the Second Prize being Rs. 25.

6. Finance

It has been decided to print separately the accounts of the Institute for the year under report.

7. Academic Session

Details of the academic calendar (1964-65) for the various courses are given below :

	Commencement of session	Close of session
5-year B.Tech. Degree Course		
I year	1-7-64	15-5-65
II, III & IV year	8-7-64	15-5-65
V year (accelerated course)	9-3-64	9-1-65
3-year B.Tech. Degree Course		
I year	3-8-64	9-6-65
II year	8-7-64	9-6-65
M.Sc. Degree Course		
I year	3-8-64	29-5-65
II year	8-7-64	29-5-65
M.Tech. Degree Course		
I year	12-8-64	29-5-65
II year	8-7-64	29-5-65

The Institute was closed from the 11th February 1965 to the 8th March 1965 at the suggestion of the State Government due to the disturbed conditions in the Madras State during this period.

8. Seminars and Symposia

(a) The Institute collaborated with the Institute of Applied Manpower Research and the All-India Council of Technical Education in organising the seminar for bringing about a closer understanding between the employers and educationists in the problems involved in effecting better coordination between engineering education and the employment of engineering manpower, with special reference to mechanical and electrical engineering specialities and engineering education at the diploma level. The seminar was attended by representatives from most of the public sector industries of the South and the representatives of the Government of India, State Governments of Andhra, Kerala, Madras and Mysore, Railways, the Electricity Boards of Andhra and Madras, and technical institutions, both central and regional and the United States Agency for International Development (USAID), Delhi.

(b) A symposium on utilisation of chlorine and development of chlorine-based products in India was the second of the seminars to be organised at this Institute under the joint auspices of the Development Council for Inorganic Chemical Industries, New Delhi, the Alkali Manufacturers' Association, Bombay, and the Indian Institute of Technology, Madras. Sixty-five papers from leading chlorine manufacturers and users, research laboratories and institutions, including contributions from Germany, Switzerland, Japan and Italy were presented at the symposium, which considered at length, the possibilities of an economic utilisation of chlorine in inorganic and organic process industries as in the manufacture of chlorides, phosphoric acid, phosphates, refrigerants, polymers, etc.

Eighty delegates from all over India participated in the symposium.

The following members of the academic staff delivered lectures at other institution and conferences :

Institute/ Conference	Member of Staff	Title of Lecture
Annamalai University	Prof. S. Sampath, Head of the Department of Electrical Engineering	"Analog Computing Techniques".
Madras Centre of Institute of Engineers	Dr. Gerhard Rouve, Department of Civil Engineering	"Trends of Hydro Power Development".
Conference on Management Education in India sponsored by the USAID at Udaipur.	Prof. R. K. Gupta, Department of Humanities	"Modern Trends in Accounting and Controls".

9. (a) RESEARCH

With additional equipment having been obtained, set up and commissioned in the various Departmental laboratories, the research activities gained momentum. The number of scholars engaged in research in the different Departments is given below :

Department	No. of Scholars	
	Part-Time (Staff members)	Full-Time
Chemical Engineering	7	..
Civil Engineering	1	2
Mechanical Engineering	..	1
Chemistry	..	3
Mathematics	..	5
Physics	3	..

Research papers and articles written by the academic staff of the Institute were published in learned journals in India and

abroad. Full details of their research activities, and papers contributed by them may be found in the reports of the respective Departments.

(b) Outstanding Contributions

(1) Dr. S. R. Valluri, Head of the Department of Aeronautics and Applied Mechanics was awarded the Wright Brothers Medal for outstanding contribution in the field of Aeronautics. He is the first Indian to receive this coveted award. The research paper that won him the Medal was entitled " Further consideration of a Theory of Crack Propagation in Metal Fatigue " presented at the 1963 SAE National Aeronautic and Space Engineering and Manufacturing meeting held in Los Angeles.

(2) Dr. P. Venkata Rao and Shri B. Ramaswami, both of the Department of Electrical Engineering presented a paper on the Transformer Analogy Servo Analyzer cum Synthesiser (TASAS) at the I.E.E.E. International Convention held in New York in March 1964.

(3) Dr. D. V. Reddy of the Department of Aeronautics and Applied Mechanics gave a colloquium lecture on " Vibrations of certain Grid Frameworks " at the North Western University, Evanston, Illinois, U.S.A.

(4) Between June 1964 and February 1965, Dr. V. Anantharaman, Assistant Professor of Economics, undertook and completed a Questionnaire Survey at the Binny's Engineering Works, Meenambakkam and Ashok Leyland Company, Ennore, on behalf of the Industrial Relations Research Institute, Wisconsin University, U.S.A., as part of their international labour market research programme.

(c) Deputation of Members of the Staff

Details are tabulated below :

S. No.	Period of Deputation	Seminar/Conferences/Conventions/ Summer schools, etc.	Member of Staff	Department
1.	12th and 13th October, 1964	Symposium on Development of Chemical Industries in South India, Neyveli	Dr. D. Venkateswaralu	Chemical Engineering
2.	2nd December, 1964	Eighth meeting of the Commonwealth Advisory Aeronautical Research Council symposium in collaboration with Aeronautical Society of India, Bangalore	Shri P. Srinivasan & Shri G. Bapaiah	Applied Mechanics -do-
3.	14th to 22nd December, 1965	International Geological Congress, New Delhi	Shri V. D. Muthayya	Civil Engineering
4.	15th to 24th December, 1964	International symposium on Scattering of Neutrons on Solids and Liquids, Atomic Energy Establishment, Bombay	Shri R. Srinivasan	Physics
5.	22nd to 24th December, 1964	Ninth Congress of the Theoretical and Applied Mechanics, at Indian Institute of Technology, Kanpur	Dr. S. D. Nigam	Mathematics
6.	26th to 28th December, 1964	Annual meeting of the Indian Institute of Chemical Engineering, Bangalore	Dr. D. Venkateswaralu & Dr. T. Gopichand	Chemical Engineering -do-
7.	31st December, 1964 to 6th January, 1965	Combined 51st and 52nd Session of the Science Congress, Calcutta	Dr. S. C. Das	Mathematics
8.	5th to 15th January, 1965	Seminar on Sounding Rocket Techniques, Physical Research Laboratory, at Ahmedabad — Kodaikanal — Thumba	Dr. W. Koch	Physics
9.	11th to 13th February, 1965	Symposium on Behavior of Soil under Stress, Indian Institute of Science, Bangalore	Prof. P. C. Verghese	Civil Engineering

S. No.	Period of Deputation	Seminar/Conferences/Conventions/ Summer schools etc.	Member of Staff	Department
10.	4th to 9th March, 1965	Conference on Management Teaching for a Developing Economy, USAID, at Allahabad University	Prof. R. K. Gupta	Humanities
11.	12th March, 1965	Symposium on Foundation of Power House and Heavy Machines, Poona	Shri M. S. Subramanian Shri R. Radhakrishnan &	Civil Engineering -do-
12.	29th April, 1965	Seminar on the Madras Labour Market, Madras	Prof. R. K. Gupta, Dr. V. Anantharaman & Dr. V. C. Venkatesh	Humanities -do- Mechanical Engineering
13.	3rd to 17th May, 1965	Summer School in Organic Chemistry, Punjab University, Chandigarh	Dr. G. Aravamudham	Chemistry
14.	24th & 25th April, 1965	Silver Jubilee and Symposium at the High Explosives Factory, Poona	Dr. D. Venkateswaralu	Chemical Engineering
15.	May, 1965	Regional Research Laboratory, Hyderabad	Shri R. Vedaraman & Shri A. Ramani	Chemical Engineering -do-
16.	May, 1965	Summer School on Heat Treatment of Metals, Roorkee University	Shri B. Raghunath Rao	Metallurgy
17.	2nd to 22nd May, 1965	Summer School on Magnetic Research and Solid States Physics, Nainital	Dr. C. Ramasastry & Shri Y. V. G. S. Murthy	Physics -do-
18.	21st June to 9th July, 1965	Summer School on Numerical Analysis, Poona	Dr. N. M. Raghavendra	Chemical Engineering
19.	21st to 24th June, 1965	Symposium on Operation Research, Indian Institute of Technology, Kanpur	Dr. K. S. Raman & Dr. R. Subramaniam	Electrical Engineering Mathematics
20.	21st June to 9th July, 1965	APTI Special Summer School on Machine Processes, P. S. G. College of Technology, Coimbatore	Dr. V. C. Venkatesh	Mechanical Engineering

10. Faculty Association:

The idea of starting an Association known as The Faculty Association was first mooted out at a meeting of the staff members on 29th July, 1960. Since the establishment of the Institute in July 1959, there was steady increase in the number of its academic staff members in the various departments and it was, therefore, felt necessary to have a common forum for them to meet among themselves and also to meet distinguished visitors. Dr. Fischer, Consul for West Germany inaugurated the Association on the 6th September, 1960 and delivered a lecture on "German Economy and Foreign Aid".

The Faculty Association has been organising, since its inception, a number of lectures and seminars on subjects of mutual interest to the members in addition to being 'At Home' to meet several distinguised visitors to the Institute. During the year under report, the following distinguished speakers addressed the Faculty Association:

1. Mr. W. J. M. Paterson, Deputy High Commissioner, U.K.
2. Prof. G. D. Boaz and
3. Maj. Jaffreys.

The Association was 'At Home' to meet the Teacher Guests from the other I.I.T's. This gave an opportunity for exchange of ideas.

A Seminar on the Joint Entrance Examinations for the I.I.Ts. was conducted and the deliberations of this seminar were very useful for the delegates who attended the Committee meeting on this subject matter at Kharagpur.

Office bearers for the year 1964-1965 were as follows:—

President	..	Prof. B. Sengupto.
Vice-Presidents	..	Dr. H. Heitland
	..	Prof. S. Sampath
Secretary	..	Dr. T. Gopichand
Joint Secretary	..	S. Balakrishnan
Treasurer	..	Dr. L. V. K. V. Sarma
Auditors	..	Dr. V. Sethuraman
	..	Dr. S. C. Das

Though the Association has been mainly functioning to bring together the academic staff members of the various departments to promote a better understanding among them, many other Associations like the Institute Gymkhana, the Staff Club, etc., have come up with a view to promoting the specific areas of activities of the resident community. The Executive Committee of the Association has now set out to redefine its scope and functions to make them more purposeful. It is hoped that with these new objectives, the Association will shape itself into an influential academic body which will reflect and recommend considered views of the intellectual entity on matters of vital interests in the years to come.

11. STAFF:

Prof. B. Sengupto continued to be the Director of the Institute.

Shri R. Natarajan I.A.S., who has been the Registrar of the Institute from its very inception laid down office on the 4th April 1965 to rejoin the State Government from where his services had been lent to the Institute. Prof. C. V. Sethunathan succeeded him as Registrar on the 5th April 1965.

The staff and students of the Institute arranged a social get-together on the 1st April 1965 to bid farewell to Shri R. Natarajan. Dr. A. L. Mudaliar who presided over the function and many others paid glowing tributes to the very valuable services rendered by Shri Natarajan to the Institute as its first Registrar for about six years.

The Institute extended a cordial welcome to the following German Professors who joined during the Year.

Name	*Department*	*Date of Joining*
Dr. F. W. Lohr	Mechanical Engineering	2-3-1965
Dr. H. W. Meyer	Electrical Engineering	9-4-1965
Dr. E. Hohmann and Dr. R. J. H. Bisanz	Chemical Engineering	29-5-1965 6-3-1965

12. DISTINGUISHED VISITORS:

Being a higher technological Institution of national importance and having well-equipped laboratories and workshops, a visit to the Institute is invariably included in the itinerary of foreign dignitaries and other distinguished persons visting Madras. Besides, parties of students from various technical and other Institutions in the country make frequent visits to the Institute. During the year under review, the Institute had the pleasure of receiving a number of distinguished visitors among whom mention may be made of the following :

(1) His Excellency Mr. Kurt Georg Kiesenger, Chief Minister of Badan Wuerthemburg, West Germany.

(2) Mr. J. M. Milligan, Specialist in Technical Education, Ministry of Education, United Kingdom.

(3) A team of leading West German industrialists led by Dr. Hans Kurze, General Manager, Klem Pumpan, Gmbh.

(4) A Japanese Goodwill Mission led by Mr. Takeshi Maniya, Professor, Department of Liberal, Yokohama National University, Japan.

The complete list of distinguished visitors is given in Appendix IX.

13. CONSTRUCTION PROGRAMME:

The tempo of construction work during the year continued unabated. Works costing of the order of about eighty lakhs of rupees were executed and all the major instructional buildings were completed and commissioned.

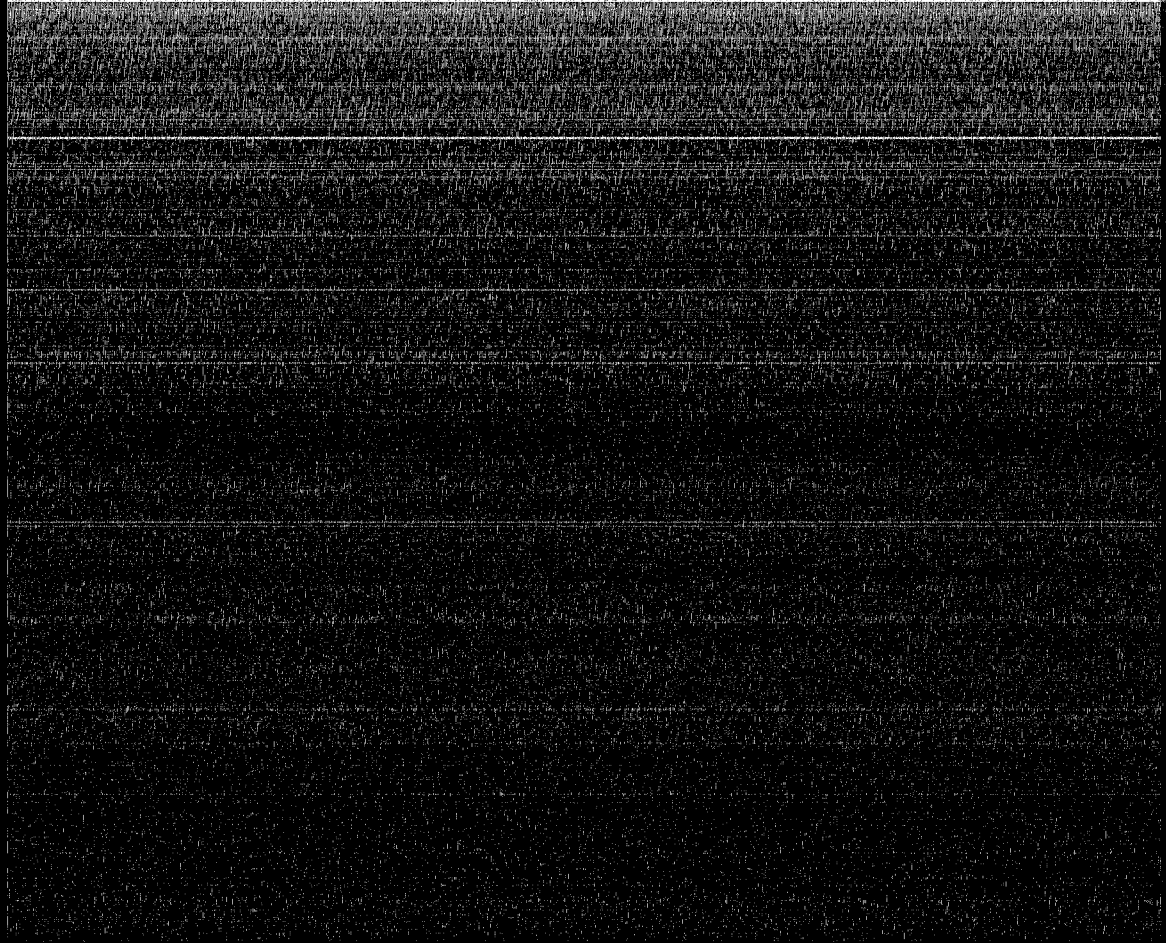
The following works were completed:—

(1) Workshop for Chemical Engineering Department.

(2) Coal bunker and store shed for inflammable materials.

(3) Metrology Block.

(4) Reinforced cement concrete overhead tank of 25,000 gallons capacity near the Four Unit workshop type laboratory.



(5) Fencing around the Campus and masonry compound wall from the sewage farm to the junction of Guindy-Adyar Road.

The following works are under progress:—

(1) Thermodynamics and Combustion Laboratory.
(2) Workshop for Hot and Cold working of Metals.
(3) Underground reservoir of 1,00,000 gallons capacity.
(4) A second Oxidation Pond.

14. HOSTELS:

The construction of the seventh and eighth hostels, the Ganga and the Jamuna, which was in progress last year has been completed. Both the hostels have been commissioned. The construction of the ninth hostel has been taken on hand.

15. LIBRARY:

The Library remained open on all days of the year (excepting the seven closed holidays) between 7-30 a.m. and 9-00 p.m. On Sundays, second Saturdays and other closed holdidays the library was open between 9-30 a.m. and 5-00 p.m.

During the year under report, 4040 books and 909 journals and periodicals were procured for the library. The expenditure on the library for the year was Rs. 1,37,875.

The Senate constituted a Committee in August 1964 to supervise the working of the Library as envisaged in Section 4(2) (h) of the Statutes with the following members :

1. Dr. S. Ramaseshan
2. Prof. S. Sampath
3. Prof. R. Krishnamurti
4. Dr. P. C. Varghese
5. Dr. H. Heitland
6. Shri R. Natarajan (the then Registrar) and
7. Shri P. S. Srinivasan (Assistant Librarian).

It was also decided that during the absence of Dr. S. Ramaseshan, Dr. S. D. Nigam will take his place as Convener.

The Committee met five times during the year.

The Committee has been of immense help in reorganising and suggesting improvements for the library. Other particulars about the Library will be found in the report under Library.

16. EQUIPMENT:

In accordance with the 1st Indo-German agreement, German equipment continued to be supplied to this Institute by the Federal Republic of West Germany. The value of the German equipment received during 1964-65 amounted to Rs. 37,57,280. We have so far received more than Rs. 150 lakhs worth of German equipment out of the Rs. 180 lakhs provided in the Indo-German Agreement. The Institute is so grateful to the Federal Republic of West Germany for the continued encouragement and help that the Institute received in abundant measure from that Government. The details of equipment received by each Department may be seen in the Departmental reports.

The Institute purchased Indian equipment costing about Rs. 7,24,870 in the year.

17. INDUSTRIAL VISITS:

Visits to major industrial units in the country were arranged for the students of the Institute to enable the potential engineers to appreciate the practical production processes in relation to their academic background. Some of them are listed below :

Outside:

1. Atomic Energy Establishment, Trombay.
2. Indian Institute of Science, Bangalore.
3. Hindustan Machine Tools Factory, Bangalore.
4. Neyveli Lignite Corporation.
5. Krishnarajasagar Dam.
6. Pykara Dam.
7. Malampuzha Dam.

Local:

1. The Integral Coach Factory.
2. T.I. Cycles Factory.

18. Students' Placement:

Businessmen and industrial magnates visited the Institute as usual to interview the students for being absorbed in their undertakings in the years to come. One such visit was by Dr. R. V. Tamhanker, Director of the Defence Metallurgical Research Laboratory, Ministry of Defence, Government of India at Hyderabad. He interviewed the final year Metallurgy students in December 1964 for filling up the posts of Junior and Senior Scientific Officers in the Defence Metallurgical Research Laboratory. After the interview, formal application forms were distributed to the candidates to be filled in and sent. These prospective metallurgists are likely to be absorbed when they pass out of this Institute.

19. The Alumni Association:

The Alumni Association of the I.I.T., Madras was formally inaugurated by Prof. B. Sengupto on the 10th July, 1964.

At the first meeting on 10th July 1964 the executive body was elected by the then graduates. Dr. M. V. C. Sastri was nominated as the President and Dr. B. V. A. Rao as the Treasurer by the Director, Prof. B. Sengupto. The executive body took charge on 1st September, 1964. It consisted of Dr. M. V. C. Sastri, President, Dr. B. V. A. Rao, Treasurer, Shri B. S. Sudhir Chandra, Vice-President, Shri A. T. Santhanam, Secretary, Shri R. Sridhar, Joint-Secretary, Shri S. Nageswar and Shri Ishwar Chandra, members. Shri S. Gopalakrishnan, an alumnus, was coopted a member of the Executive Committee.

The very first task the Executive Committee took up was to compile a complete directory of our alumni. The idea of having a directory of this type came to us from the Director, Prof. B. Sengupto, who is evincing keen interest to give it stature. Letters were sent out to all the past students requesting them to furnish information regarding their placement. Most of them responded and appreciated the idea of the Association in bringing out a directory. The information will indeed help towards compilation of an appropriate and up-to-date directory.

It is gratifying to note that among the first batch of graduates, all have enrolled as members of the Association. It is sincerely hoped that the succeeding batches will also evince keen enthusiasm and help the Association to grow into a strong organisation.

To look after the interests of the alumni in the vital matter of placement, the Institute has set up a Placement Section with the President of the Alumni Association as ex-officio in charge. He is assisted by an Advisory Council consisting of the Heads of all the Engineering Departments. The Section has started functioning since December last and is expected to gather momentum as time goes by. In the first batch, out of 107 students in all, about 49 graduates are working as technologists in the private and public sector undertakings and about 47 are pursuing higher studies at home and abroad. As the record shows, it is indeed a good augury for the placement section of the Alumni Association.

In one of the meetings of the Executive Committee it was decided to bring out a magazine dealing with the activities of the alumni and news about the campus. To help in this venture, the Executive Committee approached Prof. S. Sampath and Shri V. S. Kumar who consented readily to associate themselves with the publication of this brochure. The first annual number of the Association was brought out on the occasion of the Second Alumni Day.

It is hoped that in the next academic year the Alumni Association will continue to discharge its functions viz., placement for the alumni, bringing out of the annual magazine etc., etc., more effectively drawing from the experience gained.

20. INSTITUTE GYMKHANA:

The Institute Gymkhana continued its work in regard to the games and sports, literary and cultural activities of the students, besides organising the inter — I.I.T. Meet, mentioned earlier. The Gymkhana Committee under the presidentship of Dr. P. C. Verghese rendered yeomen service in organising and conducting the sports and games, cultural and other activities,

The Physical Training Instructors of the Institute continued their useful work in shaping the performance of the students in the games, athletic and sports events.

The Institute won the following trophies in the various tournaments conducted during the year.

	Name of the Tournament		*Event*
1.	Aboobacker Memorial Shield	..	Badminton (Fives)
2.	Bertram Tournament — Loyola College Cup	..	Tennis (Singles)
3.	Sundharavadhanam Cup — Jain College	..	Tennis (Singles)
4.	Bertram Tournament — Runners Permanent Cup	..	Badminton (Fives)
5.	Third Inter — I.I.T. Meet Rolling Trophy	..	Foot-ball
6.	Third Inter — I.I.T. Meet Rolling Shield	..	Volley ball
7.	Permanent Silver Lamp, P.S.G. College, Coimbatore, Silver Jubilee	..	Quiz Competition
8.	Saturday Evening Club Shield	..	Quiz Competition
9.	Mohanmullji Chordia, Rolling Cup, Jain College	..	Debate

At the ninth Inter—University Youth Festival held in November 1964 at New Delhi, the Institute contingent put up a very good show in the cultural and literary items, debates and group discussion. They were also privileged to meet Shri Lal Bahadur Shastri, our dear and renowned Prime Minister of India.

The report on the activities of the Institute Gymkhana games report, report on the Fine Arts, Publication Committee and Literary Activities Report for the year 1964-65 are given in the Gymkhana report.

21. MOUNTAINEERING:

With the conquest of Everest by Tensing and the establishment of a Mountaineering Institute at Manali under the care of the Government of India to train young men and women to climb the mountains, mountaineering as a pastime has caught the imagination of the adventurous young people in this country. This Institute is in the forefront in this sphere. Cadet Jaikumar of this Institute was one of the five mountaineers chosen for the Mulkila Prabhat Himalayan Expedition from all over the country. He was one of the final three to reach the height of about 20,400 feet and has set up the world record for being the first teenager ever to climb so high.

Another of our students, Sgt. George Verghese was selected for the N.C.C. Adventure Course conducted by the Himalayan Mountaineering Institute at Darjeeling. He was the proud recipient of the Principal's Medal awarded by that Institute for the best trainee.

22. N.C.C.

The year under report is a landmark as far as the N.C.C. is concerned. The Old Rifle Companies were converted into Technical Units — an Engineering Company with a strength of 200, an E.M.E. unit with a strength of 400 and a Signals Company with a strength of 200. Details on the activities of the N.C.C. will be found under the N.C.C. report. It is also proposed to introduce an Air Wing in the next academic year.

23. CAMPUS ACTIVITIES

(a) *Stores*:

The I.I.T. Co-operative Stores entered the third year of its business activity during the year. Elections were held for the office bearers for the first time, at which Prof. M. C. Gupta and Shri P. Poornanjaneya Sastry were chosen as President and Secretary respectively. To cater to the needs of the residents in the campus, a branch of the Stores was opened at the Shopping Centre in October 1964. Besides consumer articles, provisions, oils and cereals are sold at this branch. Yeomen service was

rendered by the stores in arranging to supply rice and sugar to the residents in the campus of the Institute especially when these commodities were in short supply.

(b) *Canteen*:

The I.I.T. Co-operative Canteen which commenced functioning in the campus with effect from 2nd January 1964 completed one year of its working on the 31st of December, 1964. The canteen has been fulfilling a long-felt need of the staff of the I.I.T., Madras and has been functioning quite satisfactorily. The Annual General Body Meeting of the Staff Canteen was held on the 30th March 1965, when elections were held for the Board of Directors. Prof. R. Krishnamurthi continued to be the nominated President while Shri V. K. Vaidyanathan and Shri J. C. S. Venkatarangam were elected as Secretary and Assistant Secretary respectively.

The newly elected Board of Directors, commenced functioning from the 1st of April 1965.

(c) *Entertainments*:

During the year, a group of Bavarian folk musicians visited the Institute and gave a feast of melodious songs. The playing on the instruments by the Roepfl Family Trio and the Toni Goth Sexette, in particular elicited loud cheers from the audience. Members of the troupe from the Brigham Young University, Utah, U.S.A., also visited the Institute and gave performances which regaled the audience. The puppet show performance by Albrecht Roser of Germany was another attraction during the year. A packed enthralled audience wonderingly watched the dextrous movements of the marionettes on the make-shift stage.

(d) *Staff Club*:

During the year, a staff club was organised in the campus to provide the staff members and their families recreational, cultural and social amenities. Membership of the club is open to all staff members of the Institute.

The club was inaugurated by Sri R. Venkataraman, Minister of Industries, Madras Government, on 21st April, 1965. The following are the office bearers for this year.

Patron — Prof. B. Sengupto.
President — Prof. R. G. Narayanamurthy.
Vice-President — Prof. S. Sampath.
General Secretary — Dr. V. Sivaramakrishnan.
Treasurer — Shri P. S. Srinivasan.
Secretary for Games — Shri V. Radhakrishnan.
Secretary for Fine Arts — Shri C. M. Gopal.
Secretary for Ladies Club — Smt. C. M. Gopal.

Other members of Executive Committee — Prof. C. V. Sethunathan, Dr. G. Rouve, Dr. N. Klein, Dr. B. V. Aswathnarayana Rao.

At present there are about 240 members in the club. A reading room and facilities for all indoor and outdoor games are provided in the club. Dance, Drama, Music performances and film shows are arranged at regular intervals for the benefit of the members and their families.

(e) *Ladies' Club* :

A Ladies' Club has started functioning in the campus of the Institute during the year under report. The Club was formally inaugurated by Lady A. L. Mudaliar.

Smt. Shanti Sengupto is the President of the Club. Smt. Vijayalakshmi Gopal and Smt. Urmila Narayanamurthi are the Secretary and Treasurer of the Club, respectively.

The Club conducts classes in sewing, music and dance, cookery, fruit and food preservation, etc. The Club also arranges regular entertainment programmes in the campus.

(f) *Knick-Knack* :

A Western style restaurant, "*The Knick-Knack*", run by a private contractor, was opened in the campus of the Institute on 15th March, 1965, to cater to the needs of the cosmopolitan residents in the campus and distinguished visitors.

24. Institute Day

The Institute Day was celebrated on the 4th April 1965 under the presidentship of Dr. A. L. Mudaliar, Chairman of the Board of Governors of the Institute.

Shri M. Bhakthavatsalam, Chief Minister of Madras who was the Chief Guest on the occasion was welcomed by Prof. B. Sengupto, Director. This was followed by the reading of the Annual Report by Prof. P. C. Verghese, President of the Institute Gymkhana. Shri R. Natarajan, Registrar, gave a humorous talk on " Mutiny on the Bounty ".

After the president's speech, the Chief Guest distributed prizes to the students for academic distinction (1963-64) as well as for the various items of competition organised by the Institute Gymkhana in the fields of sports, literary and other extra-curricular activities. He also released the Sixth Annual Number of the Institute Magazine.

There was a variety entertainment programme by the staff and students of the Institute.

The Second batch of graduates who took their degrees on 3-4-1965 was also present on the occasion.

25. Conclusion

The tempo of the activities of the Institute at the end of the previous year did not abate during the year, but gained momentum owing to the holding of the two convocations — one at the beginning of the year and the other at almost at the end of the academic session, Inter-I.I.T. Meet, holding of seminars and the like.

Six years have passed by — thanks to the most valuable West German Aid and the encouragement and spontaneous help rendered to the Institute by the Central Government, the Madras State Government and all our well wishers we can look back with satisfaction that something concrete and valuable

has been achieved by us in these six years. The seventh year — let it be rung in with our eyes eagerly on the following:

1. Institution of the Aeronautical Engineering Branch of Study for the 5-year B. Tech. Degree Course.
2. Institution of the Post-graduate Diploma Course in Industrial Engineering.
3. Registration of the Research Scholars in Engineering and Technology.
4. The ninth 'river' in the campus coming into shape and getting its full quota.
5. The 'best house' for the N.C.C. and a 'nice' hospital building.
6. The commissioning of the Machine Tools Laboratory and the Steam Laboratory.
7. The "sowing of the seeds" for the Central Library, the Administration Block, the Women's Hostel, the Central School Hostel, a pool to swim, a canal to cross and cross, a park for children and one for adults too, and a score of others — let the Computer do the rest.
8. The signing of the Second Indo-German Agreement, our proud privilege, and above all,
9. The renovation of the temple for Lord Jalakanteswara in the Campus with the prayer.

ॐ

सहनाववतु सहनौ भुनक्तु सहवीर्यं करवावहै ।

तेजस्विनावधीतमस्तु मा विद्विषावहै ॥

ओं शान्तिः शान्तिः शान्तिः ॥

II. REPORTS FROM DEPARTMENTS AND OTHERS

1. DEPARTMENTS

(a) DEPARTMENT OF AERONAUTICS & APPLIED MECHANICS

1. Academic Staff

Professor	1
Assistant Professors	3
Lecturers	8*
Associate Lecturer	1
Senior Technical Assistant	1

* Out of these 4 went to the United States for further studies.

2. Teaching Facilities

Teaching is undertaken for appropriate undergraduate classes of the 5-year and 3-year B.Tech. Degree courses.

M.Tech. Degree course in Civil and Mechanical Branches.

3. Laboratories/Workshop Facilities

Three laboratories are functioning—

1. Elasticity Laboratory.
2. Vibrations Laboratory.
3. Fluid Mechanics Laboratory.

Workshop facilities are being built up.

4. Seminars

Departmental Seminars were held throughout the year periodically.

Dr. D. V. Reddy gave a colloquium lecture at Northwestern University, Evanston, Illinois, on *Vibrations of certain Grid Frameworks.*

5. List of Publications by the Staff Members

(i) Shri N. R. Rajappa—" On the Vibration of Circular Orthotropic Plates under Tension or Compression ", *Journal of Physical Society of Japan,* Vol. 19, p. 584 (1964).

(ii) Shri N. R. Rajappa—" On a Relation Between Vibration of Orthotropic Plates and Buckling of Isotropic Plates ", *Journal of Physical Society of Japan,* Vol. 19, p. 409 (1964).

(iii) Dr. D. V. Reddy and Shri A. C. Gangadharan—" Ultimate-load analysis of an Edge-loaded Rectangular Slab Resting on Soil ", *Concrete and Constructional Engineering,* London, Vol. LIX. 12 ; 445-448 (1964).

(iv) Dr. D. V. Reddy and Shri N. R. Rajappa—" Frequency Analysis of Certain Inter-connected Beam Systems ", *Journal of Applied Scientific Research, Section A,* Vol. 12, 407-416 (1964).

(v) Dr. D. V. Reddy, Shri N. Krithivasan and Shri T. S. Venkataramanan—" Analysis of a Corner supported Grid Framework by Translational Moment Distribution ", *Indian Concrete Journal,* Vol. 38, 10,383-388 and 394 (1964).

(vi) Dr. D. V. Reddy, Shri M. J. Forrestal and Shri G. Herrmann—" Response of a Cylindrical Shell to an Elastic Medium ", *American Society of Civil Engineers, Engineering Mechanics Division,* Vol. 91, Prof. Paper 4354, June 1965, pp. 1-11.

(vii) Dr. D. V. Reddy and Shri A. W. Henry—" An Experimental Study of Elasto-plastic Behaviour of Certain Grid Frameworks ", *Experimental Mechanics, Society for Experimental Stress Analysis,* Vol. 5, 120-125 (1965). Paper presented at the Annual Meeting of the Society for Experimental Stress Analysis at Cleveland, Ohio, 1964.

(viii) Dr. N. V. Chandrasekhara Swamy—" The Turbulent Boundary Layer " to appear in *Engineering & Science.*

1964 edition. A new analysis of the turbulent boundary layer which gives a unified velocity distribution over the entire boundary layer.

(ix) Dr. R. S. Alwar and Shri K. T. S. Iyengar—" Elastic stress analysis of jointed half-plane ", *Journal of the Franklin Institute,* October 1964.

(x) Dr. R. S. Alwar and Shri K. T. S. Iyengar—" Stresses in a layered half-plane " — Prof. A. S. C. E., Engineering Mechanic Division, August 1964.

(xi) Dr. R. S. Alwar—" Dislocations on Elasto-static stress analysis of a perforated square plate."

6. RESEARCH PROJECTS

Dr. N. V. Chandrasekhara Swamy

1. " Non-Newtonian Fluid Lubrication of Slider Bearings ", Analysis of a slider bearing using a power-law fluid as a lubricant.
2. " Effect of free stream disturbance on a laminar boundary layer ".

(b) DEPARTMENT OF CHEMICAL ENGINEERING

1. ACADEMIC STAFF

Professors	..	..	3
Assistant Professors	..	..	3
Lecturers	..	..	10
Associate Lecturers	..	..	5
Senior Technical Assistants	..	..	7
Junior Technical Assistants	..	..	3

2. TEACHING FACILITIES

(*a*) *Undergraduate classes* :
  (1) 5-year Degree course.
  (2) 3-year Degree course.
(*b*) *Post-graduate classes* : M. Tech.
(*c*) *Doctoral course* : 8 staff members working for Ph.D.

3. Laboratories/Workshop Facilities

The following are functioning :

(*a*) Technical analysis
(*b*) Chemical technology
(*c*) Fuels testing
(*d*) Fluid flow
(*e*) Mechanical operations
(*f*) Particle size analysis
(*g*) Heat transfer
(*h*) Mass transfer
(*i*) Instruments
(*j*) Departmental workshop
(*k*) Research laboratories

The following are under development :

(*a*) Cellulose technology
(*b*) Synthetic products technology

4. Educational Tours

The final year Chemical Engineering students of the 5-year B.Tech. Degree course were taken on an educational tour to Neyveli Lignite Corporation, Neyveli, for four days in November 1964.

5. Seminars (Colloquia)/Special Lectures attended by the staff members

1. " Planning of Inorganic Chemical Industries " by Shri P. K. Seshan, Development Officer (Alk.), Ministry of Industry and Steel, D.G.T.D., (Alkalis and Allied Chem. Dte.), Government of India, New Delhi.
2. " Use and Abuse of Computers " and " Statistical Methods in Research " by Prof. C. E. Dryden, UNESCO Visiting Professor in Chemical Engineering, Indian Institute of Technology, Kanpur.
3. " Thermodynamics of Reacting System " by Dr. V. S. Rao, Associate Professor of Chemical Engineering, Indian Institute of Technology, Kanpur.

4. "Desalination of Water" by Dr. R. L. Datta, Assistant Director, Central Salt Research Institute, Bhavanagar.

5. "Manufacture and Processing of Styrene-Butadiene Rubber" by Dr. N. M. Patel, Synthetics and Chemicals Ltd., Bareilly.

6. "Chemical Plant Design" by Shri N. K. Sen Gupta, Process Plant Engineers Ltd., Calcutta.

The Department organised a Symposium on Utilisation of Chlorine in collaboration with the Development Council for Inorganic Chemical Industries, New Delhi, and the Alkali Manufacturers' Association, Bombay. The Symposium was held for three days from the 28th to 30th of March 1965 and was attended by about 100 delegates from industries, universities and research establishments in various parts of the country.

Shri R. Vedaraman and Shri A. V. Ramani attended the Summer School in Chemical Engineering organised by the Regional Research Laboratory, Hyderabad.

Dr. N. M. Raghavendra attended the Summer School in Numerical Analysis at Poona.

Shri K. Ramamurthy took training in Heavy Chemicals and Fertilisers for four months in various industries.

Shri R. Subramaniam took training in Synthetic Technology for four months in Bombay.

Dr. K. Subbaraju took training in Atomic Energy Establishment, Trombay, for one year in Nuclear Engineering.

Dr. D. Venkateswarlu, Dr. T. Gopichand, Shri T. Venkatram and Shri M. S. Murthy attended the Annual Meeting of the Indian Institute of Chemical Engineers at Bangalore.

Dr. Bisanz and Dr. Venkateswarlu delivered lectures on Cellulose Technology and Mechanical Operations respectively at the Summer School in Chemical Engineering at Hyderabad.

6. Major Equipment procured during the year under report

1. Long tube natural circulation evaporator.
2. Thin film evaporator.
3. Spray dryer.
4. Ball Mill with variable drive.
5. Plate and frame filter press.
6. Universal batch centrifuge.
7. Vibrating screen.
8. Dense medium cyclone Separator.

7. Research work done by the staff members

1. Compaction of solids.
2. Fluid-Particle and Particle-Particle Inference Studies.
3. Studies in Neyveli Lignite Tar.
4. Studies on separation of phenols from tar acids.
5. Studies in pneumatic feeding of solids.
6. Pressure drop and bed density studies in down-flow fluidisation.
7. Mass transfer studies on washing of nitrobodies.
8. Kinetics studies of benzene nitration in a continuous stirred reactor.

8. List of publications by the staff members

1. Compaction of Solid Powders, *Chemical and Process Engineering*, **45**, No. 8, 406-12 (1964).
2. Fluid Particle and Particle-Particle Inference Studies, *Indian Journal of Technology*, **2**, No. 11, 383-384 (1964).

9. Research Scholars

There was no full time research scholar in this Department during the academic session 1964-65. However, the following

members of the staff were engaged in research on a part-time basis on the subjects mentioned against their names :

Name	*Research Topic*	*Date of registration*
Shri Y. B. G. Varma	Compaction of Solids (Expected to submit his thesis in September 1965).	17-12-1962
Shri M. Ramanujam	Fluid Energy Grinding	8- 2-1963
Shri N. Subramaniam	Studies in Fluidization	11-11-1963
Shri K. Ramamurthy	Heat Transfer Studies in Fluidization	11-11-1963
Shri R. Subramaniam	Kinetics of Liquid and Vapour Phase	11-11-1963
Shri R. Vedaraman	Studies in Size reduction	11-11-1963
Shri C. Sivaprasada Rao	Liquid-liquid equilibrium	19-11-1962

(c) DEPARTMENT OF CIVIL ENGINEERING

1. Academic Staff

Professors	2
Assistant Professors	2
Lecturers	11
Associate Lecturers	8
Senior Technical Assistants	2
Junior Technical Assistants	4

2. Teaching Facalities

(*a*) *Undergraduate classes* : Courses in Civil Engineering Branch were offered for B.Tech. Degree (both 3-year course and 5-year course).

(*b*) *Post-graduate classes* : Courses were offered for the M.Tech. Degree in the following branches :

(i) Structural Engineering
(ii) Hydraulic Engineering
(iii) Soil Mechanics and Foundation Engineering

(*c*) *Doctoral Course* : One candidate is doing research on "Stress Distribution in Frame Corners" for the Ph.D. Degree.

3. Laboratories/Workshop Facilities

The department has the following laboratories for undergraduate, post-graduate and research work : Survey, Geology, Soil Mechanics, Concrete, Highways and Structures. In addition the Hydraulics laboratory is being equipped.

4. Educational Tours

The students of the IV year class of the 5-year B.Tech. Degree course went on an educational tour to Bangalore, Mysore, Pykara, Ooty, Kundah, Parambikulam and Alwaye. The tour was of 15 days duration.

5. Seminars (Colloquia)/Special Lectures attended by the Staff Members

(*a*) The following Symposiums were attended by the members of the staff.

(i) Symposium on Behaviour of Soils under Stress organised by the Indian Institute of Science, Bangalore, was attended by Dr. P. C. Varghese, Shri P. K. Ninan and Shri B. Ramanathan.

(ii) Symposium on Foundations of Power Houses and Heady Machines organised by Indian National Society of Soil Mechanics and Foundation Engineering at Central Water and Power Research Station, Poona, was attended by Shri R. Radhakrishnan and Shri M. S. Subramanian.

(iii) Seminar on Technical Education in India by the Institution of Engineers, Madras Centre, was attended by Dr. V. Sethuraman.

(iv) International Geological Congress at New Delhi, January 1965, was attended by Shri V. D. Muthayya.

(*b*) The following special lectures were also attended by the members of the staff :

(i) A series of lectures on Computer programme on the I.B.M. 1760 by Dr. Von Zoren of the Stanford University at the Engineering College, Guindy.

(ii) Lectures on Digital Computers by Dr. K. S. Raman, Electrical Engineering Department, Indian Institute of Technology, Madras.

(iii) Lectures on Turbulance by Dr. S. D. Nigam, Mathematics Department, Indian Institute of Technology, Madras.

(iv) Special lecture on Trends of Hydro-Power Development by Dr. Rouve at the Institution of Engineers, Madras Centre.

6. MAJOR EQUIPMENT PROCURED

(i) *Concrete Laboratory* : Hydraulic Trolley Jack (capacity 10 tons), Needle vibrator, vibrating Table, Cathetometers 7 Nos., Concrete mixer (capacity 7/10 c.ft.), Six Record Potentiometric strip recorder.

(ii) *Highways Laboratory* : E.V.T. Viscometers 2.

(iii) Hunter's short Base, Y level, Duplomot printing machine, Diagonal Eyepiece, Stadi Altimeter; Unimat 12" lathe.

(iv) *Soils Laboratory* : Bishop's Pore Water Apparatus for Triaxial Test, Volume change Apparatus for Triaxial Test, Versa Tester 30,000 lbs. capacity; Hot Air ovens for drying soils, Hot Plate, Consolidometer Battery containing 8 cells.

(v) *Public Health Laboratory* : P H meter 1 No., conductivity measuring Bridge.

(vi) *Hydraulics Laboratory* : Four pump sets of different capacities, equipment to study notches and orifices, Point gauges, differential manometers, price current meter.

(vii) *Structures Laboratory* : L. F. Industrial Oscilloscope, Hand operated prestressing jack, Strain measuring bridge 2 Nos. Hydraulic Slip Jack (capacity 50 tons.)

7. Research work done by the staff members

(i) The following research works were completed :

(*a*) Investigation of Prestressed Encased Steel Beams.
(*b*) Investigation of R. C. Frame Corners.
(*c*) Joints in Precast R. C. Members.
(*d*) Ultimate load investigation of virendeel girders.
(*e*) Application of the boundary layer control to overflow spillways.
(*f*) Studies on Hydraulic Jump on sloping floors.
(*g*) Some studies on Electrical Treatment of fine grained soils.
(*h*) The stability of Deep Foundation in sand.
(*i*) The effect of Surcharge on sub-grade modulus for sand.
(*j*) Studies on expensive clays.
(*k*) Development of load cells with strain guages.

(*l*) Design and fabrication of a deformeter for model analysis.

(ii) The following research works were in progress :

(*a*) Thermal characteristics of R. C. slabs.

(*b*) Precast units for floors, roofs and walls.

(*c*) Investigation of Braced Domes.

(*d*) Studies on spillway profiles functioning under heads higher than the design lead.

(*e*) Thermal stresses in gravity dams.

(*f*) Analytical study of boundry layer on overflow spillway profile.

8. LIST OF PUBLICATIONS BY THE STAFF MEMBERS

(1) Shri T. P. Ganesan, " Load Tests on Napier Bridge, Madras ", *Journal of the Indian Roads Congress*, June 1964.

(2) Shri R. Radhakrishnan, " A note on Flexusal Vibrations of an Interconnected Beam system ", *The Bulletin of the Indian Society of Earthquake Technology, Roorkee ;* July 1964, Vol. I. No. 2.

(3) Shri R. Radhakrishnan, " Bending of Orthotropic plates under edge compression and lateral load ", *Sirpur Industries Journal,* March 1965.

(4) Shri P. K. Ninan, " Experimental studies on the stability of well foundation for bridges in sand ", *Journal of the Indian National Society of Soil Mechanics and Foundations Engineering ;* October, 1964. No. 4 ; Vol. III.

(5) Dr. Gerhard Rouve, Notes on Fluid Mechanics Part I and Part II.

(6) Shri M. H. Abdul Khader, Notes on Machanics of Sediment Transport.

9. RESEARCH SCHOLARS

Following is the list of Research Scholars registered for the Degree of Ph.D. in the Department :

Name	*Research topic*	*Date of registration*
Shri N. Sukesan Nair (full-time)	Structures	4- 1-1964
Shri K. Sankaran (staff member, at present out of India)	Soil Mechanics	21-11-1964
Shri R. Radhkrishnan (staff member, part-time)	Structures	3- 6-1965

(d) DEPARTMENT OF ELECTRICAL ENGINEERING

1. ACADEMIC STAFF

Professors	3
Assistant Professors	5
Lecturers	16
Associate Lecturers	3
Senior Technical Assistants	4
Junior Technical Assistants	5

2. TEACHING FACILITIES

(*a*) Five-year B.Tech. Degree Course (Heavy Current Engineering/Light Current Engineering).

(*b*) Three-year B.Tech. Degree Course (Heavy Current Engineering/Light Current Engineering).

(*c*) Post-graduate M.Tech. Degree Course (Electronics/Control Systems/Power Systems).

(*d*) Facilities for part-time work by staff members for the Doctorate Degree are available. Three staff members have been registered for the Ph.D. Degree programme.

3. LABORATORY/WORKSHOP FACILITIES

Laboratory facilities in Electrical Machines, Electrical Measurements, High-Voltage Testing, Electronics and Analog Computation are available.

4. EDUCATIONAL TOURS

The pre-final year students of the three-year and five-year B.Tech. Degree Course undertook a three-week education tour. They covered Bangalore, Bhadravati, Sharavati, Hyderabad, Poona and Bombay and visited the industries, laboratories and educational institutions in and around these places.

5. SEMINARS AND SPECIAL LECTURES ATTENDED

(*a*) A member of the staff was deputed to attend the Computer Society of India meeting held in Bombay, in June 1965 ; he presented a paper.

(*b*) A member of the staff was deputed to participate in the Operations Research Symposium, held at the Indian Institute of Technology, Kanpur, in June 1965.

6. SPECIAL LECTURES DELIVERED BY STAFF MEMBERS

The following special lectures were delivered :—

(*a*) 'Digital Computer Proframing' in the Civil Engineering Department.

(*b*) 'Frequency Response of Linear Systems' at the Summer School on Servomechanism, organised by the University of Baroda in April 1965.

7. MAJOR EQUIPMENT PROCURED

The following items of equipment were received and commissioned during the year under report :—

(*a*) Energymeter Testing Desk.

(*b*) Six high-voltage construction sets.

(*c*) Impulse and D.C. high-voltage sets capable of voltages up to 260 KV.

(*d*) 200 KV. A.C. high-voltage set.

8. RESEARCH WORK DONE BY STAFF MEMBERS

Research work is in progress in the broad areas of Network Analysis and Synthesis, Electric Machines, Control Systems, Vacuum Tube and Transistor Electronics and Power System Analysis and Protection.

9. LIST OF PUBLICATIONS BY STAFF MEMBERS

(*a*) "Analytical study of Double-Circuit Transmission Lines....." (Dr. K. S. Raman, *Indian Journal of Technology,* January, 1965).

(*b*) "Generalised Phase Charts for a certain class of Servo-Systems" parts I and II, (Shri V. Seshadri), (Accepted for publication in condensed form in IEEE Transactions on Automatic Control).

(*c*) "A National Examination for Standardisation of Engineering Services" published in abstract form in the "Proceedings of the Seminar on Technical Education" by the Institution of Engineers, India. (Shri V. Seshadri)

(*d*) "Digital Computer Study of a Piece-wise Linear System" presented at the Computer Society of India meeting held in Bombay in June 1965. (Dr. K. S. Raman, Shri V. Seshadri and Shri V. Jayaraman).

10. GENERAL

30 students of the second batch of the 5-year B.Tech. Degree Course in Electrical Engineering graduated during the year under report. Shri C. R. Muthukrishnan received the President's Medal for securing the highest position among the B.Tech. Degree graduates of the Institute.

The first batch of twelve students in the M.Tech. Degree Course in Electrical Engineering Branch completed their Project and Dissertation Work.

Two members of the staff and two post-graduate students of the Department secured high merit positions in the all-India Combined Engineering Services Examinations. A member of the staff stood first in some of the services.

11. FULL-TIME SCHOLARS

Shri K. Padmanabhan who has already completed his Ph.D. Degree programme in the Madras University has joined this Department on the 1st of September 1965.

He has been awarded a National Institute of Sciences Research Fellowship and is doing post-Doctoral Work on "Theory of Non-linear Aspects of Electrical Engineering".

12. PART-TIME SCHOLARS REGISTERED FOR THE PH.D. DEGREE

Name	*Topic of Research*	*Date of Registration*
Shri B. Ramaswamy, Lecturer, (gone to U.S.A.)	"Transformer Analog Computers for use in Servo-mechanism"	1- 9-1963
Shri S. S. Yegnanarayanan, Lecturer.	"Transient analysis of Autodyno"	26-11-1965
Shri V. Seshadri, Lecturer.	"Certain Methods of Analysis and Synthesis for third Order Linear Systems and their extended application to Higher Order Systems".	1- 1-1965

(e) DEPARTMENT OF MECHANICAL ENGINEERING

1. ACADEMIC STAFF

Professors	6
Assistant Professors	2
Lecturers	18
Associate Lecturers	8

2. Instructional Facilities

The Department of Mechanical Engineering offered instructional facilities leading to the Bachelor's Degree in Mechanical Engineering and other branches for all the years of the 5-year B.Tech. stream and the first two years of the 3-year B.Tech. stream. The second batch of students of the 5-year B.Tech. Degree course in Mechanical Engineering completed their course by the beginning of 1965. Production Engineering and Design were offered as electives in the final year of their curricula.

The first batch of the two-year Master's Degree course in Mechanical Engineering instituted during July 1963, majoring in Machine Design completed their course during the end of the academic year. Five staff members of the Department were enrolled in their first year Master's degree course in Mechanical Engineering, during July-August 1964. Two Departmental staff members were registered for the Ph.D. in Mechanical Engineering.

3. Laboratory Facilities

Installation and commissioning of the equipment of the Laboratories — IC Engines, Steam, Thermodynamics, and Machine Tool were in progress this year. The construction regarding Turbomachines, Hydraulic Machines, Hot Working Metrology and Instruments Laboratories was in progress. Instruction in General Machines, Metrology and Materials Handling and Machine Tools, IC Engines and Thermodynamics laboratories were organised. Construction work of the Thermodynamics and Combustion laboratories has commenced. Equipment from Germany have been progressively received for the various laboratories during the year.

4. Educational Visits

Visits to major industrial units in Madras were organised for the benefit of the IV and V B.Tech. (Mechanical students) to appreciate production processes in relation to their theoretical background.

5. Seminars

Seminars were organised for the staff and post-graduate students regularly. The staff also attended seminars and lectures relating to their fields of specialisation organised by the sister departments.

At the seminar on "Machine Tool Utilisation" Prof. Lohr gave a course of lectures on "Machine Tool Utilisation". Dr. V. C. Venkatesh presented a paper on "Tool Wear", at the Seminar on "Metal Cutting".

6. Research Activities

Research activities of the Department cover the following fields :—

High temperature phenomenon and its technical application.

Fundamental studies and technical combustion processes under high altitude and high flow velocities.

Direct energy conversion.

Photographing flow propagation by Schieleron technique.

High temperature measurements in gas stream by pneumatic temperature probe.

Ignition characteristics of fuels as obtained from adiabatic compression machine and shock tube.

Pulsating combustion studies.

Turbulent mixing in constant pressure combustion chambers.

Scavenging of two-stroke engines.

Fuel injection in SI engines and combustion chambers.

Investigation of multiple engines.

Damping effect on vibrations during machining.

Diffusion wear of HSS tools.

Spark erosion ; Oscillating tools ; Tool Wear.

Design aspects ; Bolted joints in fatigues ; Loading of hoisting ropes ; Weldments in fatigue.

Investigation of : Frequency and statistical effects in fatigue ; Wear in metal to metal contact.

7. RESEARCH SCHOLARS

Shri M. C. Gupta, a staff member, registered for the degree of Ph.D. in the Department on 21-11-1964 on the subject " Combustine in Gas Turbines ". He is at present abroad.

8. CENTRAL WORKSHOPS

(*a*) *Organisation* :—

(i) Carpentry Shop
(ii) Fitting Shop
(iii) Smithy Shop
(iv) Electrical Shop
(v) Automobile Shop
(vi) Foundry and Pattern Shop
(vii) Machine Shop
(viii) Welding Shop

(*b*) Staff :—

German staff	5
Foremen	5
Supervisors	5
Mechanic A Grade	15
B „	20
C „	22

(i) Carpentry Shop

(*a*) *Organisation* :—

Foreman	1
Supervisor	1
A Grade	2
B „	4
C „	5

(*b*) *Work Orders* :—

Completed—

1. 90 items of internal works have been undertaken and completed for the Workshops such as Machine Tool Laboratory, Machine Shop, Electrical Shop, Fitting, Smithy, Welding etc. without Work Orders.

2. 60 items of Work Order jobs were also undertaken and completed for the Laboratories etc.

Under Progress : At present 6 Work Order jobs are nearing completion.

(*c*) Regular maintenance of machines in the Shop is carried out and one Saw Setting Machine has recently been installed and serviced.

(*d*) Training of students : 1 Year class of the 5-year B.Tech. Degree course.

(ii) Fitting Shop

(*a*) *Organisation* :—

Foreman	..	..	..	1
A Grade	..	..	..	4
B ,,	..	..	..	3
C ,,	..	..	..	4

(*b*) *Work Orders* :—

Completed : 62 Work Orders have been completed.
Under Progress : 10 Work Orders are under progress.

(*c*) *Training of students* :—

I year class of the 5-year B.Tech. Degree course.
III year class of the 3-year B.Tech. Degree course.

(iii) Smithy Shop

(*a*) *Organisation* :—

Foreman	..	..	..	1
B Grade	..	..	..	2
C ,,	..	..	..	2

(*b*) *Work Orders* :—

Completed : 5 Work Orders have been completed.

(*c*) *Installation Maintenance and repairs etc* :—

1. Fabrication of Prototype Smithy Forges — 4 Nos.
2. Erection of Pneumatic and drop forge hammer.
3. Erection of Saltbath furnace grinders etc.
4. Shifting the various equipments pertaining to Smithy to New Smithy Bay.

(*d*) 1. Work Orders scheduling chasing of progress and also maintaining all the paper work involved from the receipt of original work order from the various Departments till the completion form is issued.
2. Fabrication of Triangular pieces for the Stadium Gantry work out of M.S. round 2410 Nos.
3. Fabrication of 3 Nos. Crucible frame handles to Foundry.
4. Forging and Heat-Treatment of HSS tools 60 Nos. to fitting.
5. Forging and Heat Treatment of HSS Tools 30 Nos. to Machine Shop.
6. Case Hardening of Trisquare 70 Nos. Fitting.
7. Turning tools hardening of Trisquare and tempering —7 Nos.
8. Heat-Treatment of Silver Steel Pins—17 Nos.
9. Bright annealing aluminium tokens—210 Nos.
10. Annealing of leaf spring plates—50 Nos.
11. Heat-Treatment of milling arbor—2 Nos.
12. Vice jaws for Metallurgy—8 Nos.

Many jobs like forging of wedges for foundation, splitting of foundation bolts and also wide range of odd jobs from the various Shops and Departments were undertaken.

(*e*) *Training of students* : 1 year class of the 5-year B.Tech. Degree course.

(iv) Electrical Shop

(*a*) *Organisation* :—

Foreman	..	..	..	1
A Grade	..	..	..	1
B „	..	..	..	2
C „	..	..	..	1

(*b*) Conducting of classes for students, theoretical and practical II year class of the 5-year B.Tech. Degree course, M.Tech. Degree course—Mechanical Engineering.

(*c*) Carrying out new electrical installation for the German equipment at all the departments of the Institute.

(*d*) Maintenance and repairs to electrical installations as mentioned under (*c*).

(*e*) Carrying out repairs of all the German equipment in all the departments of the Institute.

(*f*) Arrangements and setting up of all equipment and other facilities for the efficient running of the Electrical Shop.

(*g*) 25 Work Order -- installations have been carried out and completed.

(v) Automobile Shop

(*a*) *Organisation* :—

Supervisor	.. .. ..	1
B Grade	.. .. ..	1
C ,, (Truck Driver)	.. ..	1

(*b*) Maintenance and repairs to I.I.T. Vehicles.

(vi) Foundry and Pattern Shop

PATTERN

Organisation :—

Supervisor	.. .. ..	1
A Grade	.. .. ..	1
B ,,	.. .. ..	1
C ,,	.. .. ..	1

Work Orders :—

Completed—4 Work Orders have been completed.
Under progress—1 Work Order is under progress.

FOUNDRY

Organisation :—

Supervisor	..	..	..	1
A Grade	..	..	..	1
B „	..	..	..	2
C „	..	..	..	1

Work Orders :—

Completed—22 Work Orders have been completed.
Under progress—7 Work Orders under progress.

Training of students :—Second year class of the 5-year B.Tech Degree course.

(vii) Machine Shop

(*a*) *Organisation* :—

Supervisor	..	..	..	1
A Grade	..	..	..	4
B „	..	..	..	4
C „	..	..	..	5

(*b*) *Work Orders* :—

83 Work Orders have been completed. 5 Work Orders are pending due to want of materials from the Departments concerned.

(*c*) Installed one Openside Planer, Hydraulic-Pneumatic 1.5m stroke.

(*d*) *Training of students* :—II and IV year classes of the 5-year B.Tech. Degree course.

(viii) Welding Shop

(*a*) *Organisation* :—

Foreman	..	..	..	1
A Grade	..	..	..	2
B „	..	..	..	1
C „	..	..	..	2

(*b*) *Work Orders* :—

87 work orders have been completed.

(*c*) Installed one Butt-Welding Machine and one CO_2 Welding Machine.

(*d*) Total grills fabricated — 3,078 Nos.
Open rack with 4 trays — 170 Nos.
Open rack with 5 trays — 190 Nos.
Stadium complete structure work — 13 girders, 26 columns, 82 tress etc.
Drawing table — 530 Nos.
Lecture hall desk and benches — 290 Nos.

(*e*) *Training of students* : I year classes of the 5-year and 3-year B.Tech. Degree courses.
IV and V year classes in Metallurgy Branch of the 5-year B.Tech. Degree course.

(f) DEPARTMENT OF METALLURGY

1. ACADEMIC STAFF

Professor	..	..	..	1
Assistant Professors	..	..	..	2
Lecturers	..	..	..	2
Associate Lecturers	..	..	..	2

2. TEACHING FACILITIES

(*a*) *Undergraduate classes* :

Instruction was provided by the staff of the department for students in the various branches of engineering during the various years of their courses in metallurgical subjects. They are indicated below :

A. *5-year B.Tech. Degree course* :

(i) II year (all branches)—Engineering Materials—(Metals).

(ii) (a) III year (Mechanical, Electrical and Chemical Engineering branches) — Engineering Metallurgy.

(b) III year (Metallurgy Branch)—Metallurgical Analysis.

(iii) IV year (Metallurgy Branch)—

(a) Refractories, Furnace Technology and Pyrometry.
(b) Electrometallurgy and Corrosion.
(c) Metallurgical Thermodynamics.
(d) Physical Metallurgy-I.
(e) Ferrous Production Metallurgy-I.
(f) Non-ferrous Production Metallurgy-1.
(g) Mechanical Metallurgy-1.
(h) Joining of Metals.
(i) Project Work and Works visits.

(iv) (a) V year (Metallurgy Branch)—

(*i*) Foundry Technology.
(*ii*) Powder Metallurgy.
(*iii*) Metallurgical Plant Design.
(*iv*) Advanced Metallurgical Techniques.
(*v*) Physical Metallurgy-II.
(*vi*) Ferrous Production Metallurgy-II.
(*vii*) Non-ferrous Extraction Metallurgy-II.
(*viii*) Mechanical Metallurgy-II.
(*ix*) Instrumentation.

(b) V year (Mechanical Engineering Branch)—Production Engineering.

B. 3-*year B.Tech. Degree course* :

(i) I year 1st term. (Metallurgy Branch)—Materials of Construction (Metals).

(ii) (a) II year 1st term (Metallurgy Branch)—

(*i*) Metallurgical Analysis.
(*ii*) Metallurgical Thermodynamics-I.
(*iii*) Refractories, Furnace Technology and Pyrometry.

(b) II year 2nd term (Metallurgy Branch)—

(*i*) Electrometallurgy and Corrosion.
(*ii*) Metallurgical Thermodynamics-II.
(*iii*) Physical Metallurgy-I.
(*iv*) Mechanical Metallurgy and Joining of Metals.
(*v*) Foundry Technology.
(*vi*) Metal Physics.

(c) II year 2nd term (Mechanical Engineering Branch)— Engineering Metallurgy.

(iii) (a) III year 1st term (Metallurgy Branch)—

(*i*) Physical Metallurgy-II.
(*ii*) Mechanical Metallurgy-II.
(*iii*) Ferrous Process Metallurgy-I.
(*iv*) Non-ferrous Extraction Metallurgy-I.
(*v*) Advanced Metallurgical Techniques-I.
(*vi*) Project Work.

(b) III year 2nd term (Metallurgy Branch)—

(*i*) Ferrous Production Metallurgy-I.
(*ii*) Non-ferrous Extraction Metallurgy-II.
(*iii*) Instrumentation.
(*iv*) Advanced Metallurgical Techniques-II.
(*v*) Metallurgical Plant Design.
(*vi*) Powder Metallurgy.
(*vii*) Physical Metallurgy-III.
(*viii*) Mechanical Metallurgy-III.
(*ix*) Electives.

C. *Post-graduate Degree Courses* :

Instruction in Materials Science and Technology for the M.Tech. students (all branches) in the topics assigned to this department were given.

D. *Doctral Courses* :

One candidate was registered during the year for his doctorate work and carried out some preliminary work in this regard.

3. LABORATORIES/WORKSHOP FACILITIES

Regular Laboratory work has been carried out for both sets of undergraduate students. Installation of vertical pulsators and high frequency high vacuum furnace is complete, but their commissioning has to be taken up.

4. EDUCATIONAL TOURS

Apart from a week of training in local industrial establishments, a special training programme for the final year students with Tata Iron and Steel Company, Hindustan Steel and National Metallurgical Laboratory was arranged during the year under review. The special features of this training programme were the detailed introductory lectures every morning on the particular practical operations to be observed and studied by the group of students during the rest of the afternoon and the special seminar type of discussion after the practical study of operations. The training programme was of a month's duration and embraced practically all aspects of the manufacture of iron and steel and their wrought products.

5. SEMINARS (COLLOQUIA)/SPECIAL LECTURES ATTENDED BY THE MEMBERS OF THE STAFF

A special lecture was delivered by Prof. Haymann, French scientist. This was attended by all the students and staff members of the department.

6. MAJOR EQUIPMENT PROCURED

A few of the important items of equipment obtained during the period under review are as follows :

(*i*) Carbon and Sulphur estimation apparatus.
(*ii*) Metal cutting circular saw machine.
(*iii*) Point counter with counting unit.
(*iv*) Sieve shaker.

7. RESEARCH WORK DONE BY THE STAFF MEMBERS OF THE DEPATRMENT

Although facilities for experimental work were extremely limited due to non-availability of accommodation in the earlier

stages and requisite water and power facilities, considerable amount of study and preparation of relevant literature surveys as a preliminary to taking up research work was carried out. The elective work of the final year students also required preparation of special apparatus and this work was also carried out under the guidance of the staff members. Mention can be made of preliminary studies of age hardening, kinetics of metallurgical transformations particularly of the austenite martensite reaction, preparation of thin films of metals for study of their mechanical and physical properties, evaluation, stacking faults in cold worked brass and evaluation of average cross-section of pores in powder compacts.

(g) DEPARTMENT OF HUMANITIES

1. Academic Staff

Professors	3
Assistant Professors	2
Lecturer	1
Associate Lecturer	1
Senior Technical Assistants	2
Junior Technical Assistant	1

2. Teaching Facilities

Undergraduate Classes

5-Year B.Tech. Degree Course

I Year — English.

II Year — English and German.

III Year — History and Culture.

IV Year — Economics.

V Year — Industrial Economics, Planning, Cost and Book-keeping, General and Industrial Psychology and Industrial Management.

3. SEMINARS (COLLOQUIA)/SPECIAL LECTURES ATTENDED BY THE MEMBERS OF THE STAFF

(1) Prof. R. K. Gupta talked to the participants in the Executive Development programme organized by the South India Textile Research Association at Kodaikanal for the executives from its member textile mills in the South.

He also attended the Conference on Management Education in India sponsored by the USAID at Udaipur from the 4th to 9th of February 1965. He spoke on 'Modern Trends in Accounting and Controls'.

(2) Dr. V. Anantaraman had undertaken and executed a questionnaire Survey at the Binny's Engineering Works, Meenambakkam and Ashok Leyland Company, Ennore on behalf of the Industrial Relations Research Institute, University of Wisconsin, Madison, Wisconsin, U.S.A. as part of their International Labour Market Research Programme. The period of Survey was between June 1964 and February 1965.

(3) Shri V. S. Kumar and Shri B. Dias underwent a short course lasting three weeks on the teaching of English specially organized for lectures in English in Engineering colleges at the Central Institute of English, Hyderabad.

4. RESEARCH WORK DONE BY THE STAFF MEMBERS

Shri T. V. Kuppuswamy — "Chieftains of the Sangam Period" South Indian History — Tamilnad. To be submitted to the University of Kerala for the award of the Ph.D. Degree. The work will be submitted in December 1966.

5. LIST OF PUBLICATIONS BY THE STAFF MEMBERS

Prof. R. K. Gupta wrote two case studies and a paper on 'Management Education in India' published in the Journal of University Education.

Shri T. V. Kuppuswamy — An Advanced History of India published by the Bureau of Tamil Publications of the Government of Madras in April 1964.

(h) DEPARTMENT OF CHEMISTRY

1. Academic Staff

Professor	..	..	..	1
Assistant Professors	..	..	..	2
Lecturers	..	..	..	4
Associate Lecturers	..	..	..	5

2. Teaching Facilities

The department provides instruction at the undergraduate, post-graduate, and doctoral levels as indicated below. This instruction includes theory and laboratory exercises.

A. *Undergraduate*

5-*year B.Tech. Degree Course*

(i) First year — All Branches ;
(ii) Third year — Chemical Engineering and Metallurgy Branches ;
(iii) Fourth year — Chemical Engineering Branch ;

3-*year B.Tech. Degree Course*

(iv) First year — All Branches ;
(v) Second year — Chemical Engineering Branch.

B. *Post-graduate — M.Sc. and M.Tech. Degree Courses*

(i) First year of M.Sc. (Physics Branch) ;
(ii) First and second years of M.Sc. (Chemistry Branch) ;
(iii) First year of M.Tech. (Chemical Engineering Branch).

C. *Doctral Courses*

Background and Orientation courses for all Scholars registered for the Ph.D. Degree in Chemistry during the first year.

3. Laboratory Facilities

Facilities are available for the courses provided under 2 (A) and 2 (B) above as also for research in Physical, Organic and Inorganic Chemistry.

4. SEMINARS, SPECIAL LECTURES, ETC.

The following lectures were organised under the auspices of the Chemistry Colloquium :

Topic	*Speaker*
(a) Desulfurisation of organic compounds by Raney Nickel	Prof. S. Krishnamurthy
(b) A month in Europe	Prof. M. V. C. Sastri
(c) Some rate measurements on thiocynate and related species	Dr. I. R. Wilson
(d) Structure-Activity relationship in ACTH	Dr. J. Ramachandran
(e) Cobaltic ions in aqueous solution	Prof. M. Santappa
(f) Molecular Excitation	Dr. V. Ramakrishnan
(g) Mechanism of oxidation by chromic acid	Dr. N. Venkatasubramaniam
(h) Mechanistic studies in the oxidation of hydrocarbons	Dr. P. S. Radhakrishnamurthy

The following Seminars were held under the auspices of the Chemistry Seminar during the year under report.

(a) Theory of reaction rates	Shri K. G. Srinivasan
(b) Electrical double layer at interfaces	Shri K. Vasudevan
(c) The present state of the Bi-complex theory of aromatic substitution	Shri P. Sidheswaran
(d) Experimental aspects of isotope effects in chemical kinetics	Shri M. Santhanam
(e) Stability Constants — their determination and significance in Inorganic Complexes	Shri D. Venkappayya

5. Major Equipment Procured

The following major equipments were purchased during the year :

(a) Kaycee Vernier type potentiometer.
(b) Manual Polarograph.
(c) Cambridge pH meter and electrotitration outfit.
(d) Liquid Nitrogen Plant.
(e) Dipole meter.

6. Research Work Done

The following research topics were under investigation during the year :

(1) Semiempirical molecular orbital studies on the structure and electronic spectra of heterocyclic compounds with nitrogen and sulphur as hetero atoms.
(2) Validity of Ho and H– functions in non-aqueous media.
(3) Adsorption studies of nitrogen and hydrogen at low temperatures on transition metal catalysts.
(4) Mechanistic studies on the dehydration of alcohols over chromia.
(5) The kinetics of bromination of phenols.
(6) Physical properties of catalysts and their catalytic activity.
(7) Phase equilibrium and aqueous chemistry studies of Thiourea complexes with zinc, mercury and cadmium salts.
(8) Analytical applications of Chloramine–T.
(9) Mechanism of dehydration of alcohols over alumina.
(10) Mechanism and stereochemistry of ether formation.
(11) Steric effects in the dehydration of alcohols to olefins.
(12) Application of Kramers — Kronig dispersion relationship for the evaluation of optical constants of metals from reflectivity data and ellipsometry.
(13) Use of potential — pH diagram for the interpretation of corrosion.
(14) Effect of adsorption on electrochemical kinetics.

7. LIST OF PUBLICATIONS BY STAFF MEMBERS OF THE DEPARTMENT

(1) An adsorbed phase substitution — elimination mechanism for dehydration, Shri J. R. Jain and Shri C. N. Pillai, Tetrahedron letters, No. 11, 675 (1965).

(2) Studies in the system zinc sulphate-thiourea-water, Shri G. Aravamudan and Shri M. R. Udupa, communicated to the Summer School in Inorganic Chemistry, Chandigarh.

(3) Competitive reactions in the study of chlorination of olefins, Dr. J. C. Kuriacose, communicated to the Seminar on "Reaction Kinetics and Mechanism", Tirupati.

(4) An apparatus for low and high temperature goniometry of hygroscopic crystals — Shri G. Aravamudan, Shri G. Srinivasamurthy and Shri S. Ramaseshan, Proc. Ind. Acad. Sci. Vol. IX, No. 1, Sec. A., 25-30, 1964.

(5) Rotating Elliptic Analysers for the Automatic Analysis of Polarised Light — Part I, Shri S. R. Rajagopalan and Shri S. Ramaseshan, Proc. Ind. Acad. Sci., Vol. LX ; A, 297 (1964).

(6) Rotating Elliptic Analysers for the Automatic Analysis of Polarised Light — Part II, Shri S. R. Rajagopalan and Shri S. Ramaseshan, *ibid,* Vol. LX, A, 379 (1964).

8. RESEARCH SCHOLARS

Name	*Research Topic*	*Date of Registration*
Shri B. Viswanathan	Absorption Studies in relation to heterogenous catalysis.	1-8-1964
Shri S. V. Kannan	Stereo-Chemistry of Catalytic Reactions.	27-4-1964
Shri R. Swaminathan	Mechanistic Investigation of heterogenous Catalytic Reactions.	1-8-1964

(i) DEPARTMENT OF MATHEMATICS

1. Academic Staff

Professor	1
Assistant Professors	3
Lecturers	2
Associate Lecturers	3
Senior Technical Assistants	2
Junior Technical Assistants	2

2. Teaching Facilities

The Department imparts instruction in Mathematics at the undergraduate, post-graduate and Ph.D. levels.

(1) Five-Year B.Tech. Degree.
(2) Three-Year B.Tech. Degree.
(3) M.Tech. (Civil, Mechanical, Electrical and Chemical Engineering).
(4) M.Sc. (Mathematics, Physics and Chemistry).
(5) Special Lectures for Ph.D. scholars.

3. Laboratory Facilities

Computation Laboratories are being brought up-to-date for the computation work which forms an integral part of the teaching curriculum in Mathematics.

4. Seminars (Colloquia), Special Lectures, etc.

A. Prof. S. D. Nigam

Attended the Congress on Theoretical and Applied Mechanics at Kanpur and gave a half-hour address on Small Reynolds Numbers.

Dr. S. K. Srinivasan
Participated in

(i) the Matscience Summer School at Bangalore in August 1964 and delivered two lectures on Non-Markovian Processes ; and

(ii) the Matscience Anniversary Symposium at Madras in January 1965 and delivered a one-hour address on Stochastic Point Processes.

Dr. S. C. Das

Attended the Indian Science Congress held at Calcutta in January 1965.

Dr. R. Subramanian

Attended

(i) the Indian Science Congress held at Calcutta in January 1965 ;

(ii) a Seminar on Pure Mathematics as applied to Statistics and Operational Research at Delhi from 28th May to 19th June 1965 ; and

(iii) the Operations Research Symposium from 21st to 24th June 1965 at Kanpur.

Shri P. Achuthan

Attended the Matscience Anniversary Symposium at Madras in January 1965.

B. During the year under report, 73 seminar lectures were held in the Department. The topics discussed were under the broad headings :

Fluid Mechanics
Elasticity
Stochastic Processes
Elementary Particle Interactions
Differential Equations

C. A series of ten lectures on 'Functional Analysis and Applications' were delivered at the Department by Professor S. Minakshisundaram, Head of the Department of Mathematics, Andhra University, between 21st June 1965 and 25th June 1965. The lectures were attended by staff and students of other departments and institutions.

The lecture notes of this series have been cyclostyled and circulated.

D. Under the joint auspices of the Department of Mathematics at Indian Institute of Technology and the Institute of Mathematical Sciences (Matscience), Adyar, special lectures on

topics of current interest in research have been arranged during the year. In this series, eight lectures, alternating between the Matscience and Indian Institute of Technology, have already been given.

E. The staff-members attended lectures delivered at the Matscience by eminent mathematicians and scientists including

Prof. M. H. Stone
Prof. Harish Chandra
Dr. J. V. Narlikar
Prof. Milne-Thomson
Prof. Victor F. Weisskopf

5. RESEARCH WORK DONE BY THE STAFF MEMBERS OF THE DEPARTMENT

Research work is in progress in the following fields.

Staff-members pursuing research	*Field*
Prof. S. D. Nigam Dr. L. V. K. V. Sarma Shri U. N. Srivastava Shri V. Subba Rao Shri C. V. Raghava Rao	*Fluid Mechanics and Magneto Hydrodynamics.*
Dr. S. C. Das Dr. R. Subramanian Dr. H. S. Paul	*Elasticity, Plasticity and Piezo-electricity.*
Dr. S. K. Srinivasan Shri P. Achuthan Shri V. Ramabhadran	*Quantum Mechanics Elementary Particle Interactions.*
Dr. S. K. Srinivasan Shri N. V. Koteswara Rao Dr. R. Vasudevan Prof. Alladi Ramakrishnan	*Stochastic Point Processes and Cascade Showers* (I.I.T.-Matscience collaboration).
Dr. S. K. Srinivasan Dr. R. Vasudevan	*Random Fields and Brownian Motion.*
Dr. S. K. Srinivasan Dr. R. Vasudevan	*Random Equations and Noise Phenomena.*
Dr. S. K. Srinivasan Shri N. V. Koteswara Rao	*Stochastic Theory of Dams*
Shri D. S. Subramanyam	*Differential - Difference Equations.*

6. A. List of publications by the staff members

Prof. S. D. Nigam :

Flow at small Reynolds Numbers (To be published in forthcoming Proceedings of Ninth Congress on Theoretical and Applied Mechanics).

Dr. S. K. Srinivasan :

1. A Novel approach to the Theory of Shot Noise *Nuovo Cimento,* **38**, (1965), 979.
2. On a class of Markovian Processes associated with correlated pulse trains and their application to Barkhausen Noise. (with Dr. R. Vasudevan).
3. Sequent correlation functions and their applications to cascade theories. *Nuovo Cimento,* **33**, (1964), 273. (with Dr. K. S. S. Iyer).
4. On Bursts produced by Muons and Electrons. *Nuovo Cimento*, **34**, (1965), 67. (with Dr. K. S. S. Iyer).
5. Some new Mathematical features in Cascade Theory. *Journal of Mathematical Analysis and Applications* — 1965. (with Dr. R. Vasudevan and Prof. Alladi Ramakrishnan).
6. Fluctuation Problems in Electro-Magnetic Cascades — III. *Z Phys.* **182**, (1965), 243. (With Dr K. S. S. Iyer).

Dr. S. K. Srinivasan and Shri P. Achuthan :

Photoproduction of Vector Mesons (under publication in *Nuclear Physics*).

Dr. S. C. Das and Dr. R. Subramanian :

1. On the stresses in twisted orthotropic Spheroids. (sent for publication).
2. On an aeolotropic solid with spherical inclusion. (sent for publication).
3. On a spherically isotropic composite truncated cone.

Dr. S. C. Das and Shri K. Kishen Rao :

1. Axisymmetric Thermal Stress in a spheroidal Shell. (under publication).
2. Stresses due to a Nucleus of thermo-elastic strain in a semi-infinite plane with a spherical cavity. (under publication).
3. Stress concentration due to a Nucleus in an infinite space with a spheroidal inclusion. (under publication).

Dr. S. C. Das and Shri V. P. Muthuswamy :

1. Motion of the elastic-plastic interface in an infinite plate with a circular hole under radial pressure.
2. Plastic flow and fracture in a thick-walled spherical shell under radial pressure.

Dr. L. V. K. V. Sarma :

Oscillation of axisymmetric bodies in an electrically conducting rotating fluid. (under publication).

Dr. H. S. Paul :

Axisymmetric vibration of electro-strictive Barium Titanate Ceramic cylinder. (under publication).

Shri V. Subba Rao :

Surface Waves in Rotating Liquids
On slow motion of a sphere in Viscous Liquids.

B. Research Reports

The following research reports have been completed :—

1. Group Theoretic Considerations in Von Karman's Problem of Rotating Disc, by Dr. S. D. Nigam and Shri V. Subba Rao.
2. Flow at Small Reynolds Numbers, by Dr. S. D. Nigam.
3. A Novel Approach to theory of shot noise, by Dr. S. K. Srinivasan.
4. On a class of Non-Markovian Processes associated with correlated pulse trains and their application to Barkhausen noise, by Dr. S. K. Srinivasan and Dr. R. Vasudevan.

5. Photo Production of Vector Mesons, by Shri P. Achutan and Dr. S. K. Srinivasan.

6. Lecture notes on functional analysis and applications, by Prof. S. Meenakshisundaram of the Andhra University.

7. The following are among the Mathematicians and Scientists who visited the department during the period under report :

Prof. B. R. Seth (I.I.T., Kharagpur).

Prof. Alladi Ramakrishnan (Matscience, Madras).

Prof. P. L. Bhatnagar (Indian Institute of Science, Bangalore).

Dr. R. Vasudevan (Matscience, Madras).

Prof. Rangaswamy (Annamalai University).

Dr. J. C. Burkill (England).

Prof. Mark Aiserman (U.S.S.R.).

Mr. Thomson (Australia).

Dr. B. S. Fadnis (Nagpur University).

Prof. Meenakshisundaram (Andhra University).

Dr. K. S. Narendra (Harvard University).

8. Research Scholars

Sl. No.	*Name*	*Topic of Research*	*Date of Registration*
1.	Shri A. Ramachandra Rao	*Wave propagation*	6- 8-1964
2.	Shri A. V. Gopalakrishna Rao	*Relativistic Hydrodynamics*	11- 8-1964
3.	Shri S. N. Venkatarangan	*Stability in Hydrodynamics*	21- 8-1964
4.	Shri Kishan Rao	*Thermo-Elasticity*	8- 9-1964
5.	Shri V. P. Muthuswamy *	*Plasticity*	25- 8-1964

* Non-stipendiary research scholar.

(j) DEPARTMENT OF PHYSICS

1. Academic staff

Professors	..	..	..	2
Assistant Professors	..	..	..	4
Lecturers	..	..	..	6
Associate Lecturers	..	..	..	9
Senior Technical Assistants		..	..	8
Junior Technical Assistants		..	..	4

2. Teaching Facilities

(*a*) *Undergraduate* : The department gives lectures and practical training to all the five-years of the 5-year B.Tech. course in all branches of Physics including Atomic, Solid State and Nuclear Physics. Lectures are also given for the 3-year B.Tech. Degree course in the first and third years.

(*b*) *Post-graduate* : The department is conducting a 2-year Master's Degree course in Physics with the subjects X-ray Crystallography, Transistor Physics, and Microwave Physics as electives.

Lectures on special aspects of Molecular, Atomic, Nuclear and Solid State Physics are given to the Chemistry and Mathematics students of the M.Sc. Degree course.

Courses on Material Science and Measurements and Instrumentation are given by this Department to the students of the M.Tech. Degree classes of this Institute.

3. Laboratory and Workshop Facilities

For the Undergraduate and Post-graduate students separate laboratories for the experiments in Mechanics, Heat Optics and Electricity are available. Facilities for advanced experiments in Solid State Physics, Atomic Physics and Electronics are provided in the Post-graduate laboratories in the Department.

A small workshop with basic machines is attached to the Department for the fabrication and repairs.

4. SEMINARS

The Department conducts seminars once a week. The Post-graduate students of this Department give seminar talks on selected topics and are assessed for the same. This forms a part of their curriculum.

The following special lectures were arranged this year :

Date	*Title of the lecture*	*Speaker*
10- 3-1965	Chemistry of Anthracene.	Dr. C. N. Pillai, Department of Chemistry, I.I.T., Madras.
20- 3-1965	Introduction to Barrier layers.	Dr. W. Koch, Department of Physics, I.I.T., Madras.
27- 4- 1965	Masers.	Dr. B. R. Bagalkoti, Regional Engineering College, Suratkal.
28- 4-1965	Physical methods in Chemical problems.	Dr. B. P. Rao, Department of Physics, Sri Venkateswara University, Tirupati.

Dr. Ramaseshan was invited to work as Senior Visiting Fellow at the Chemical Crystallographic Laboratory, Oxford, with Prof. Dorothy Hodgkin, F.R.S., N.L., O.M. He was invited to attend the meeting of the American Crystallographic Association at Gatlinburg, U.S.A. He is, therefore, abroad from September 1964.

Shri V. Ramabhadran of this Department was deputed by this Institute to attend the Summer School in Theoretical Physics in Bangalore.

5. Equipment

The following major equipment were procured during the year :

Phillips Beat frequency oscillator.
Phillips X-ray Diffraction tube.
Heathkits Oscilloscopes.
Electronic tube furnace.
OSAW Vernier potentiometer.
Electromechanical stabiliser.
ASCO Large glass Prism Spectrograph.
Electromagnet with stabilised power supply.

6. Research Activities

Research work is being carried out in the Department in the following fields :

(*a*) Crystal structure analysis of organic and inorganic crystals at low and high temperatures, phase transformation and thermal expansion studies.
(*b*) Semiconductor Physics.
(*c*) Electrical, magnetic, optical and thermal properties of crystals.
(*d*) Radiation damage and colar centre studies.
(*e*) Studies in Radioactivity and Tracer techniques.

7. Publications

Paramagnetic Centres in irradiated $NaClO_3$ and $NaBrO_3$ — Dr. C. Ramasastry, Shri S. B. S. S. Sastry, Shri Y. V. G. S. Murthy and Shri J. Sobhanadri. *Journal of Physical Society, Japan,* 19, 770, 1964.

Electron Spin Resonance Associated with Oxygen in irradiated crystals containing Oxygen rich ions — Dr. C. Ramasastry and Shri Y. V. G. S. Murthy. *Bulletin of N..I.Sc. Symp. on Spectroscopy at Radio and Microwave frequencies, Bombay* (1964).

A low temperature attachment to the Weissenberg Goniometer — Shri A. K. Singh and Dr. S. Ramaseshan. *Proceedings of Indian Academy of Sciences* **60**, 20, (1964).

A method for mounting a crystal along a specified direction — Shri A. K. Singh. *Proceedings of Indian Academy of Sciences* **60**, 122, (1964).

An apparatus for low and high temp. optical goniometry of hygroscopic crystals — Shri G. Aravamudan, Shri G. Sreenivasamurthy and Dr. S. Ramaseshan. *Proceedings of Indian Academy of Sciences* **60**, 25.

Rapid alignment of crystals in X-ray cameras — Shri S. Ramaswamy and Dr. S. Ramaseshan. *Proceedings of Indian Academy of Science* **60**, 25.

The crystal structure of $Ba(OH)_2$ 8 H_2O — Shri H. Manohar and Dr. S. Ramaseshan. *Z. Kristallogr.* 119, 357.

The crystal and molecular structure of $AsBr_3$ at—10°C. — Shri A. K. Singh and Dr. S. Swaminathan. *Current Science* **33**, 429, (1964).

The crystal co-ordination of Barium ion — Shri H. Manohar and Dr. S. Ramaseshan. *Proceedings of Indian Academy of Sciences* **60**, 297, (1964).

Galvanomagnetic effects in Semoconductor diodes — Shri B. S. V. Gopalam. *Journal of Institution of Engineers,* Vol. XLIV, No. 5, (1964).

Tunnel Diodes — Shri B. S. V. Gopalam. *Seminar on Industrial and Scientific Research, Madras,* (1964).

Rotating elliptic analysers for the automatic analysis of polarised light. Part I — Shri S. R. Rajagopalan and Dr. S. Ramaseshan. *Proceedings of Indian Academy of Sciences* **60**, 297, (1964).

Part II — *ibid.*

The use of anomalous scattering in crystal structure analysis — Dr. S. Ramaseshan. *Advanced Methods of Crystallography,* Academic Press, 1964. p. 67.

Electrical conduction in Sodium nitrate — Dr. C. Ramasastry and Shri Y. V. G. S. Murthy. *Indian Journal of Pure and Applied Physics* **3**, 265,

Strain dependance of the frequencies and thermal expansion of the hexagonal closed packed lattice — Shri R. Srinivasan and Shri R. Ramji Rao. *Inelastic Scattering of neutrons. International Atomic Energy Agency, Vienna*, (1965).

X-ray structure analysis of metachloronitrobenzene — Dr. E. M. Gopalakrishna, *Z. Kristallogr.* **121**, 378.

An X-ray study of 2-5 dichloronitrobenzene — Kum. L. Annapoorni and Shri B. V. R. Murthi. *Z. Kristallogr.* (accepted for publication).

An X-ray study of 3 nitro 4 toludin — Shri G. D. Nigam and Shri B. V. R. Murthi. *Z. Kristallogr.* (accepted for publication).

8. Research Scholars

The following are the full-time Research Scholars working in the Department :—

Scholar	*Subject*	*Date of Registration*
Shri A. K. Singh (C.S.I.R. Fellow)	X-ray Crystallography	Submitted Thesis
Kum. S. Vijayalakshmi	Magnetohydrodynamics	10-8-1964
,, L. Annapoorni	X-ray Crystallography	10-8-1964
Shri N. Harihara Iyer	Electron Paramagnetic Resonance	13-8-1964
,, K. Mallikarjuna Rao	Molecular Spectroscopy	14-8-1964
,, C. S. Sastry	Studies in Radioactivity and Nuclear Physics.	10-9-1964
,, G. D. Nigam	X-ray Crystallography	10-9-1964

PROJECT CONSTRUCTION

The tempo of construction work was sustained in the year under report.

1. Institute Building

Works of the order of about 80 lakhs of rupees were executed during the year and all the major instructional buildings have been commissioned. Electrical Sciences, Mechanical Sciences and Science and Humanities blocks have been fully completed and commissioned. Another Workshop for Chemical Engineering which was in execution during the previous year was also completed and commissioned. A new Workshop for Hot & Cold working of metals is in the advanced stage of completion. A coal bunker and a store shed for storing inflammable materials were also constructed. Separate sheds for storage of gas were constructed owing to the undesirability to store gas cylinders in the main buildings. The Thermodynamics and Combustion Laboratory is under construction. The Metrology block has also been completed.

2. Hostels (for Students)

The construction of the seventh and eigth hostels which was in progress last year was completed and occupied by the students. The construction of the ninth hostel has been taken on hand.

3. Staff Quarters and roads

The staff quarters numbering 166 taken up for execution as the second phase were completed and occupied. The work relating to the Staff Club and Stadium with play fields which was in progress during the last year has since been completed. Fencing around the campus and masonry compound wall from the sewage farm to the junction of Guindy—Adyar Road was completed. Roads with black topping have fully been laid.

4. MISCELLANEOUS WORKS

Besides a number of other works like electrical installations, sanitary works, air-conditioning *etc.,* have been executed and completed for the several buildings. A reinforced cement concrete over-head tank of 25,000 gallons capacity near the Four Unit Workshop type Laboratory was completed. A second oxidation pond is under execution. An underground reservoir of 1,00,000 gallons capacity for the collection of Corporation water is under execution. Electrical sub-stations were also completed. An out-patient dispensary is in advanced stage of completion. The construction of cycle sheds for the staff and students is in good progress. A second General Store has also been completed.

With the number of buildings constructed and by preserving big trees in tact, the premises has become a fine University campus. The scheme to make the Institute Campus a small self-contained " Satellite City " has since got its shape.

HOSTELS

(a) GANGA HOSTEL

The Ganga Hostel was ready for occupation from July '64. Thirty students of First year M.Tech. and research scholars were housed in it. Dr. D. Venkateswarlu was appointed Warden in addition to his duties as Warden of the Saraswathi Hostel. Shri K. Jaysimhulu joined the hostel as resident Assistant Warden. In spite of the small number of residents a mess was started in the hostel from October 1964 when Prof. R. K. Gupta took over as the Warden. The mess was managed by the students themselves.

During the Inter I.I.T. Sports Meet in December 1964 a majority of the sportsmen from other I.I.Ts. were housed in the hostel. The inmates looked after the comforts of the guests extremely well. The names of Messrs. Kellogg. Francis, Srinivasan, Sahasranaman, Vijayan, Subramaniam, Jacob, Das and Asirvadan, who spent several sleepless nights during the Meet, need to be particulalry mentioned. Under the able leadership of Shri K. Jaysimhulu they managed everything.

(b) GODAVARI HOSTEL

The Godavari Hostel, the fifth in order of the ten students-hostels in the campus, started the second year of functioning under the wardenship of Dr. S. K. Srinivasan.

Shri V. T. Shadagopan and Shri R. Achuthan took charge as Assistant Wardens of the hostel.

A few cultural and sports activities were held among the students of the hostel during the year.

The hostel functioned smoothly throughout with the spontaneous co-operation of all concerned and was closed for summer vacation on 15th May 1965.

(c) KAVERI HOSTEL

After a short break of nearly a month during the summer vacation, the hostel was reopened on 26th June 1964. Dr. P. Venkata Rao continued as the Warden of the hostel till 6th April 1965, when he had to relinquish the office as Warden of the hostel as he had to take up a new assignment in Africa as an UNESCO expert in Electrical Engineering. Messrs. J. Joseph of Humanities Dept., A. Chandrasekharan of the Electrical Engineering Dept. and Mr. S. K. V. K. Sobhandrachari of Physics Dept., were Asst. Wardens of this hostel during this period.

The inmates of the hostel were a heterogeneous combination of students from various classes such as I/3, I/5, III/5, IV/5, V/5, M.Sc., M.Tech. and Ph.Ds. The V/5 students completed their course by Jan. 65 because of accelerated courses and had to leave the hostel. But these graduates were back again in the hostel during the convocation period, and the Kaverites felt supremely proud over the achievements of two of their old inmates of this hostel. They were Mr. C. R. Muthukrishnan, the recipient of the President's Gold Medal and Mr. Basu John Vettath, the recipient of the Governor's Medal.

The inmates of the hostel took active part in various gymkhana activities, inter-hostel tournaments and athletic meet. Most of the medals were snatched away by Messrs. Anand Swaminathan, R. M. Nair, E. A. Olia, R. K. Verma and Anantharama Iyer of this hostel. The rolling trophy awarded by Mr. Kurt Schroeter for general championship was also won by this hostel. Besides these activities, number of students participated in different outdoor games like football, hockey, cricket, basketball etc., and won most of the prizes.

The students participated actively in traditional religious functions like Divali, Pongal, Holi and Ganesha Pooja.

A party was arranged to give a hearty send off to Dr. P. Venkata Rao on the eve of his departure to Nigeria as UNESCO expert and Mr. R. Natarajan, I.A.S., the Registrar of this Institute, who left this place to take charge as the Special Officer of the Sethusamudram Project. On this occasion the Kaverites

welcomed Dr. B. V. A. Rao, the present Warden of this hostel and Prof. C. V. Sethunathan, the Registrar of this Institute.

This hostel accommodated and played host to students of the various other I.I.Ts. during the Inter-I.I.T. Meet.

A few of the equipments like a new radio and a tricycle were purchased from the hostel funds.

Due to the enormous interest taken by the inmates of the hostel, a nice garden came up to add to the beauty of the hostel.

(d) KRISHNA HOSTEL

The year 1964-65 saw considerable innovation and activity in Krishna Hostel. The number of the hostel inmates went up to 207. The office of the Warden was filled as efficiently and energetically as ever by Dr. C. Ramasastry. Shri A. C. Gangadharan continued as Assistant Warden with ever increasing popularity. In the place of Shri P. Achuthan, Assistant Warden, Shri H. Rama Iyer came who very soon endeared himself to the inmates. Student secretaries were elected for the various committees.

Among the high-lights of the hostel activities was the inter-hostel debate held on the 15th August, 1964 which was presided over by Prof. Sampath and had a panel of judges drawn from various city colleges. The debate was followed by planting of a sapling by our Director to commemorate Vana Mahotsava. With the blessings of the Director who symbolically planted the Mahagung sapling, the Krishna Hostel area has developed into fine lawns, vegetable and flower gardens.

A Quiz programme conducted in the hostel during the early part of the academic session under review on the lines of the 64,000 quizes so popular in American T.V.R. won the appreciation of the audience and participants alike. Subramaniam emerged a popular winner — Dr. S. J. Keogh, Professor of Moral Theology, Loyola College, Madras, was the quiz master.

The opening of the hostel library is a notable event this year. This useful addition to the facilities offered by the hostel

was made possible by the efforts of the students' committees and other inmates of the hostel.

The Common Room was made comfortable and attractive by the addition of linoleum flooring, curtains, new furniture and a new radio. This together with the gardens that came up under the watchful eyes of Dr. C. Ramasastry received the appreciation of the delegates to the Third inter-IIT Meet. Our hostel played host to a considerable number of delegates. The lawns of this hostel were utilised for holding the first Boxing Tournament of the Institute during the year.

The members of this hostel have developed a sense of fellowship. They have been residing in this hostel for the past three yearrs and have developed a sense of belonging to the hostel and have striven hard to make it one of the best hostels on the campus.

(e) NARMADA HOSTEL

The Hostel functioned smoothly during the third year of its existence, with Prof. S. Sampath (Department of Electrical Engineering) continuing as Warden and Shri U. N. Srivastava (Department of Mathematics) as Assistant Warden. Shri A. Venkatesh (Department of Mechanical Engineering) joined the Hostel as the new Assistant Warden.

Owing to the reallocation of the students among the Hostels, some old-timers left and new faces made their appearance. It was not long before the inmates settled down as one close-knit family and the traditions of the Hostel in academic and extra-curricular activities continued.

Shri A. K. Chabra was elected as Student-Secretary of the Hostel for the second year in succession.

The Hostel played host to the contingent of athletes from I.I.T., Kanpur during the Sports Meet held in December 1964. At the Science Fair organized by the Gymkhana on the occasion of the Inter-I.I.T. Meet, the students of this Hostel made useful contributions, notably Shri Umesh Dutta and Shri Achia.

The students of the Hostel showed keen interest in N.C.C. work. Shri Krishna Mohan and Shri R. Kalyanakrishnan did commendable work and were promoted to the rank of Under-Officers.

Shri Prem Kumar established himself as the Carrom Champion of the Institute ; and Shri Suresh Shenoi of Shuttle Badminton. Shri Lalit Tiwari and Shri Goswamy were notable Football players for the Institute. Shri Jai Kumar climbed a height of 20,400 feet in the Himalayas and set up a world record for youngmen of his age group.

Shri S. P. Shukla, who functioned as Secretary of the Gymkhana for Literary Activities, was adjudged the best speaker in the debate held at Jain College, Madras. Shri Charanjit Singh, as Entertainment Secretary of the Gymkhana, put up a colourful record of work. Shri Charanjit Singh, Shri Ashok Khanna and Shri Rajendra Sirpal won the Junior Forms in the Cold Weather Regatta conducted by the Madras Boat Club.

The Hostel celebrated its Annual Day on 27th March, 1965, with Prof. Balakrishnan Nair, Principal of the Tagore Memorial Arts College, Pondicherry, as the Chief Guest. Mrs. Nair gave away Prizes to the winners in the Hostel Tournaments. The students entertained the Guests with a short variety programme.

The year under review was a year of consolidation and orderly growth in the life of the Hostel. The students made progress towards the goal of a healthy and meaningful corporate life. All of them and the Warden and the Assistant Wardens place on record their gratitude to the Institute authorities in the Administrative and Engineering Sections for the help and support that have been readily extended to them throughout the year.

(f) SARASWATHI HOSTEL

The Saraswathi Hostel was started in the month of July 1964, with Dr. D. Venkateswarlu as Warden, Dr. K. Ramananda Rao and Shri V. T. Sadagopan as Assistant Wardens.

The following students were the mess committee members :

1. Shri A. Chatterjee
2. ,, A. Sachithanandam
3. ,, K. Chandrasekaran
4. ,, K. K. Talwar
5. ,, Nareshpuri
6. Shri J. Seghal
7. ,, A. K. Aggarwal
8. ,, Y. N. Ramamoorthy
9. ,, S. M. Sud
10. ,, R. Neelamegham

Common Room Committee Members

Shri C. Balaram and Shri J. Swarup.

A farewell party was given to Dr. K. Remananda Rao, on 1-5-1965 by the Hostel on the eve of his departure to Germany.

Shri K. Neelamegham represented the Institute in P.S.G. College, Coimbatore, Silver Jubilee Quiz competition from the 20th to 24th August 1964, and our Institute won the Trophy.

The following members of the hostel represented the Institute in the Inter-University Youth Festival at Delhi.

1. Shri G. Kasturi
2. ,, D. Justus
3. ,, S. Vijayan
4. ,, A. Kacker

Shri A. Kacker represented the Institute in the Jain College Inter-Collegiate Trophy and won it.

The Hostel won the Inter Mural Entertainment Trophy presented by the Engineering Section. The hostel play and music group was selected for the Institute Day Entertainment Programme.

(g) TAPTI HOSTEL

The hostel admitted in July 1964, 188 students belonging to the second and third year classes of the 5 year B.Tech. Degree course and the first and second year classes of the 3 year B.Tech. Degree course. The office-bearers of the Hostel Union for the current year assumed office soon after the elections were over.

A quiz was conducted in August 1964 with Shri R. Rajasekar one of the inmates, as the quiz-master. A debate was held in August 1964 with Dr. P. C. Varghese in the Chair. The motion "Woman is nature's most agreeable blunder" was won.

Shri D. Prithivraj and Shri A. Rammohan Rao relinquished the Assistant-Wardenship in October 1964 and Shri P. K. Ninan and Shri K. S. Raghavan joined in their respective places. Shri K. S. Sankaran was relieved of Wardenship in view of his trip abroad in January 1965, and Dr. B. V. Ramanamurthy took charge as Warden in his place.

The hostel played proud host to thirty students from the Bombay contingent who participated in the Inter-I.I.T. meet held in our campus in December 1964.

The hostel acquired a good collection of gramaphone records and subscribed to a number of magazines and has one of the best common-rooms in the campus. The gardening activities improved considerably. A lawn mower was purchased. A number of film shows were arranged on the lawn of the hostel by the United States Information Service, Madras.

The hostel teams bagged a number of prizes in the Inter-Hostel tournaments and Institute Sports and presented a few interesting items of entertainment on the Institute Day. Hostel tournaments were also conducted with practically all the inmates participating.

The hostel closed in May 1965 for the summer vacation.

LIBRARY

BOOKS :

1. Total number of volumes acquired till the end of June 1965 .. 45,742
2. Number of books added during the period between July 1964 and end of June 1965 .. 4,040

JOURNALS :

3. Total number of journals received during 1964-65 909
4. Number of journals arranged Department-wise as detailed below :

Sl. No.	Department	No. of Journals received	Gift / Exchange	Total received
1.	Applied Mechanics ..	24	1*	25
2.	Chemistry ..	90	..	90
3.	Chemical Engineering ..	52	..	52
4.	Civil Engineering ..	104	1	105
5.	Electrical Engineering ..	67	2	69
6.	*Humanities*			
	English ..	25	..	25
	Psychology ..	9	..	9
	History & Culture ..	6	..	6
	Economics ..	31	1	32
	Industrial Management & Administration ..	44	1	45
	General Interest ..	42	3	45
7.	Mathematics ..	96	1	97
8.	Mechanical Engineering ..	71	2	73
	Engineering Drawing ..	16	..	16
9.	Metallurgy ..	41	2	43
10.	Physics ..	98	1	99
11.	German Journals ..	78	..	78
	Total number of journals received ..	894	15	909

* Exchange.

5. BINDING

Number of periodicals bound during the year 1964-65 and re-conditioning of books :

Journals	*Books*
5,455	3,743

6. GIFTS

Books, pamphlets, circulars, and other reading materials have been received as free gift from the following organisations :

1. Defence Science Laboratory, Metcalfe House, Delhi-6.
2. I.I.T., Kharagpur.
3. Ministry of Transport (Railway Inspectorate), Government of India, Meerut City.
4. University of Delhi, Delhi.
5. USIS, New Delhi.
6. Central Water and Power Research Station, Poona.
7. Director, Central Electro-Chemical Research Institute, Karaikudi.
8. Indian Institute of Science, Bangalore.
9. World University Service, Allahabad.
10. Khadi Gramodyog, Bombay-56.
11. Ministry of Scientific Research & Cultural Affairs, Government of India.
12. Director (Education), Govt. of India, Planning Commission, Yojana Bhavan, New Delhi.
13. Petroleum Information Service, State Bank Building, New Delhi-1.
14. Association of Consulting Engineers, Westminster, S.W. 1.
15. Indian Lead Zinc Information Centre, Calcutta-16.
16. University Grants Commission, New Delhi.
17. Highways Research Station, Government of Madras.
18. The Association of Commonwealth Universities, London.
19. Director, Institute of Applied Manpower Research New Delhi,

7. Library Co-operation

Books and journals were obtained on inter-library loan system from the following :

1. Madras University Library.
2. Madras Institute of Technology, Chromepet.
3. British Council Library, Madras.
4. USIS Library, Madras.

8. Expenditure

Books	. .	Rs. 1,11,960
Journals	. . . .	Rs. 62,850
Back volumes	. . . .	Rs. 16,215
Operating cost	. . . .	Rs. 580
Binding materials	. . . .	Rs. 6,270
Total	. .	Rs. 1,97,875

The Library continues to be located on the second floor of the Civil Engineering Department of the Institute. It remains open on all days of the year, excepting on the seven closed holidays, during the following hours :

Week days	. . 7-30 a.m. to 9-00 p.m.
Sundays, Second Saturdays and other closed holidays	. . 9-30 a.m. to 5-00 p.m.

INSTITUTE GYMKHANA

Members of Committees

Rector : PROF. B. SENGUPTO (Director)

GYMKHANA MAIN COMMITTEE : Dr. P. C. Varghese (President), Shri R. Natarajan (*Ex officio*), Shri Y. S. Ramaswamy (*Ex officio*), Dr. D. Venkateswarlu, Shri S. A. Aleem (Secretary), Shri V. Srinivasan, PTI ; Shri M. Sarvotham, PTI ; Shri P. N. Parthasarathy, Auditor (*Ex officio*).

Sports Committee : Dr. E. G. Ramachandran (Staff-in-charge), Shri M. Kalappa, Shri K. K. Batra, Shri Venkateswaran, Shri J. M. Ramappa, Shri H. S. Sahni, Shri R. P. Shetty (Secretary).

Literary Committee : Dr. N. Klein (Staff-in-charge), Shri T. S. Ananthu, Shri R. A. Vaswani, Shri K. S. Lokanathan, Shri P. Sudarsan, Shri A. Kacker, Shri S. P. Shukla (Secretary).

Entertainment Committee : Dr. G. Rouve (Staff-in-charge), Shri K. V. R. Murthy, Shri Charanjit Singh, Shri Gopal Ramachandran, Shri S. Rajan, Shri C. Balaram, Shri A. Swaminathan, Shri P. L. Kapur (Secretary).

Fine Arts Committee : Prof. R. G. Narayanamurthy (Staff-in-charge), Shri G. Philip Dinakaran, Shri M. K. Wangu, Shri R. Krishnan, Shri T. S. Muthukrishnan, Shri Ram Kumar Nayar, Shri Basu John Vetteth (Secretary).

Publications Committee : Prof. S. Sampath (Staff-in-charge), Shri C. V. Sahasranaman (Secretary), Shri M. S. Chandramouli, Shri G. M. S. Rana, Shri S. N. Buhkht, Shri S. Kalyanasundaram, Shri P. K. Goswami, Shri C. Krishna, Shri V. Siddhartha, Shri G. Mahajan.

Student Representatives : Five-year Course—Shri Suraj Alexander, Shri B. B. Kamdar, Shri H. K. Seth, Shri L. Paul. Three-year Course—Shri G. Sampath. Post-graduate Course —Shri P. Rajagopalan.

ACTIVITIES

The following were the activities of the Institute Gymkhana during 1964-65 :

Aug. 1964	Gymkhana Committee election. Participation in League Matches conducted by the Madras State Athletic Association, Madras. Participation in the Bertram Tournaments conducted by Loyola College. Participation in the Aboobacker Memorial tournament for Badminton. Participation in Jain College Tournaments. Participation in the Quiz competition conducted by the P.S.G. College, Coimbatore on the occasion of their Silver Jubilee Celebration. Annual Inter-Hostel Group Discussion.
Sept. 1964	Intramural competitions.
Oct. 1964	Annual Debate. Participation in the Inter-Collegiate Hindi Music competition organised by Agarwal Yuvak Sangh.
Nov. 1964	Participation in the 9th Inter-University Youth Festival. Participation in the Quiz Programme conducted by the Saturday Evening Club. General Knowledge Test. Essay Writing Competition.
Dec. 1964	3rd Inter-I.I.T. Meet at Madras.
Jan. 1965	Participation in the Debate programme at Jain College. Inter-Collegiate Annual Debate. Inter-Collegiate Group Discussion. Inter-Collegiate German Recitation. Inter-Collegiate Quiz. Inter-Collegiate Entertainment competition. Sixth Annual Sports Day.
April 1965	Institute Day.

Trophies from Outside Won by Our Students

The following Trophies from outside were won by our students :

1. Aboobacker Memorial Shield for Badminton—Fives.
2. Loyola College Cup—Tennis (Singles) in the Bertram Tournament.
3. Sundharavadhanam Cup for Tennis (Singles) at Jain College.
4. Runners permanent Cup for Ball Badminton—Fives, in the Bertram Tournament.
5. Rolling Trophy in the 3rd Inter-I.I.T. Meet in Foot Ball.
6. Rolling Shield in the 3rd Inter-I.I.T. Meet in Volley Ball.
7. Permanent Silver Lamp at the Quiz Competition at the P.S.G. College, Coimbatore, during their Silver Jubilee Celebration.
8. Saturday Evening Club Shield for Quiz.
9. Shri Mohanmullji Chordia Rolling Cup for Debate at Jain College.
10. Shri N. Raghavendra Rao and Shri K. M. Kripanarayan were awarded the First and Second prizes respectively at an Inter-Collegiate Hindi Music Competition organised by the Agarwal Yuvak Sangh.

Winners of Inter-Collegiate Trophies

The winners of the Inter-Collegiate Trophies during the year are listed below :

Trophy	*Winners*
1. Institute Trophy for All-India Debate.	.. Medical College, Bengal.
2. Dr. Klein's Trophy for German Recitation.	.. Max Muller Bhavan, Madras.
3. Rao Bahadur Ramachandra Iyer Trophy for Quiz.	.. I.I.T., Madras.
4. Prof. M. V. C. Sastry's Trophy for Group Discussion.	.. A. C. College of Technology, Madras.
5. Prof. Narayanamurthy's Trophy for Entertainment Competition.	.. I.I.T., Madras.

INTRA-MURAL COMPETITIONS

At the intra-mural competitions during 1964-65, the Trophies named hereunder have been won by the Houses noted against each :

Trophy	*House*
1. Sharman & Co., Trophy for Cricket	.. Jhansi Rani House.
2. Surana & Co., Trophy for Foot Ball	.. Ashoka House.
3. Pioneer Sports Co., Trophy for Hockey.	.. Jhansi Rani House.
4. Meenakshi Memorial Trophy for Volley Ball.	.. Shivaji House.
5. Mehendru Sports Co., Trophy for Basket Ball.	.. Ashoka House.
6. Schroeter's Trophy for General Championship.	.. Jhansi Rani House.
7. Individual Championship.	.. Shri Joshi Paul.
8. Best House in March Past.	.. Ranjit House.

GAMES REPORT

The year opened with the realization that the third inter-I.I.T. Meet was to be held at Madras in December. The efforts of the students were geared towards making the most of playing the host and to put in a much better performance than in the previous years.

The following is a record of the Institute's achievements during the year :—In the Loyola College Tennis Tournaments, our champion Lionel Paul, breezed through to a straight set victory to win the coveted Bertram Trophy in the singles. Partnering R. P. Shetty, he was runners-up in the doubles. In the Jain College Tournament he again gave a good account of himself, convincingly winning the singles. The performance of the Ball Badminton team was also very creditable. Captained by R. Prabhakaran, the Institute was runners-up in the Bertram Tournament and easily won in the Stanley Medical College Tournament.

Special mention should be made of hockey, football and cricket teams of the Institute as they defeated and drew with

many strong teams. In hockey the Institute was placed runners-up in the Jain College Tourney.

A scratch athletics team was entered in the Buck Memorial Meet in which A. Swaminathan raced through to victory in the 110 metres hurdles and M. Kalappa came first in the Hop, Step and Jump.

The third inter-I.I.T. Meet at Madras was opened by the Nawab of Pataudi on the 28th of December 1964. This year, unlike in the previous years, there was a sense of keen competition which enlivened the interest in the 1965 Meet.

The performance of the Institute this year completely eclipsed the tame efforts of the previous year. On the first day its Football team sprang the biggest surprise of all when it trounced the seemingly invincible holders — Kharagpur with a 2-1 victory. It then went on to win the Football Trophy with a convincing victory over Bombay. Outstanding performances in the Institute's team were those of Ray, C. M. Das, L. Tewari and custodian M. H. I. Khan. The Tennis team, in spite of Paul's decisive victory in the two singles, went down to Kharagpur. In Volleyball, Madras was to the fore again with a thumping five game victory over Kharagpur in the finals. Janardhanan and Goswami proved to be invaluable assets to the team. In Hockey the Institute was unfortunate to lose to Kharagpur in a replay of the finals, in spite of a spirited performance by our boys. In Basketball, the superb co-ordination of the Bombay team enabled it to coast through to an easy win in the finals against Kharagpur after a tough encounter with Madras. The Bombay Shuttle team had no difficulty in beating Kharagpur in the finals. Kharagpur, however, had its revenge when it beat the Table Tennis holders — Bombay, to win the Tournament. In Athletics, many of the old records fell by. The Institute's performance, however, far surpassed its expectations. Joshi Paul proved to be peerless in the 5000, 1500 and 800 metres races, and that too, the latter two in record times. Not only that, he also helped our 4 × 400 metres relay team to victory. M. Kalappa came first in Long Jump and Hop, Step and Jump, and broke the record in the latter. A. Swaminathan, G. Srikanth, Dandapani, R. Puri and S. A. Aleem gave a good account of them-

selves and were placed in their events. Swarup of Bombay wound up with the Individual championship. In Gymnastics, E. K. Olia came first in the Horizontal Bar and was placed in the other two events. Anantha Rama Iyer was placed in the Weight Lifting Competition.

The Meet concluded with Kharagpur winning the overall championship for the third time in succession, Bombay coming second and Madras, third. Dr. A. L. Mudaliar who presided over the prize distribution function, gave away the prizes.

The Institute's Sports Meet was held on the 30th of January 1965. Many old records were broken and Joshi Paul walked away with the Individual championship. Jhansi ki Rani House (Kaveri Hostel) won the Schroeter Cup for the over-all championship. In the Staff *vs.* Students Tug-of-War, in spite of the Registrar's heroic efforts, the Students once again pulled up the Staff. Dr. Reichel Edgar, Consul-General of the Federal Republic of Germany, was the chief guest of the Meet and Mrs. Reichel gave away the prizes.

Fine Arts

The Committee for Fine Arts was formed soon after the commencement of the academic year 1964-65 with Basu-John Vetteth as the Secretary.

A Science Fair was conducted in the Institute for the first time. It was held along with the inter-I.I.T. Meet from the 28th to the 31st of December. The students who made the various projects were an enthusiastic lot and it was perseverance that got the projects working.

Most of the projects were working models. Ravi Kumar's automatic clock was highly impressive. Almost every visitor tried to beat the *Battle of Numbers* made by Belani and Jain. Another machine on similar lines was made by Achia and Karve. The *Tesla Coil* by Datta and Batra always drew large crowds. Naga's *Capacitance Relay* was absolutely fool-proof! If only Sundaresan's electronic counter hadn't stopped working, it would have been possible to report the total number of visitors.

Photographs and paintings were exhibited along with the Science Fair. The main contributors were K. R. Mahesh, Olia and Purkayastha.

Saha's sketches 'The Eternal Rose' (Nehru) and 'The Eternal Flame' (Kennedy) were greatly admired. Shettigar's 'Kamala Laxman' and Santhanaraj's were appreciated.

I.I.T., Delhi also exhibited their photographs. Some of them were of a high standard.

I.I.T., Kharagpur is holding an exhibition in fine arts. We are sending a few photographs and paintings with the hope that they will secure prizes.

The Publications Committee Report

This Committee was mainly in charge of bringing out *Campastimes*, the Institute monthly. At the beginning of the year, even before the Committee had been formed, the ball had been set rolling; the Committee then moved in to augment the human resources at the disposal of *Campastimes*.

With Prof. S. Sampath as the Staff member in charge of publications and Shri C. Krishna as Editor of *Campastimes*, the Committee met frequently to deliberate on matters pertaining to the above magazine. Due to the concerted action of the Committee and the drive and energy of the Editor in particular, it was possible to bring out a succession of issues.

Other publications with which the Committee was allied with were: The third inter-I.I.T. Meet brochure, the *Campastimes* Special Supplement and the Institute Annual Magazine.

Literary Activities Report

This year saw the passing out of our stalwarts in debating and other literary activities — Ramesh Vaswani, T. S. Ananthu and V. Siddhartha.

The year started off with a bang when the first Gymkhana programme — a Staff and Students debate — was arranged. The topic for discussion was: "The responsibility for the low standard of education in India lies with the students and not with

the teachers ". This was followed by the regular cycle of Annual competitions — debate, group discussion, quiz, etc., at all of which our champions emerged victors. We also managed to arrange some talks — when we had Shri Kothamangalam Subbu to give us a talk in connection with Bharathi Day Celebrations and also we had Mr. J. D. Smith of the British Council for a talk, " Mods and Rockers ".

In inter-collegiate competitions, the Institute was, as usual, very successful. The first feather in its cap was the winning of the Inter-Collegiate Quiz Trophy for the quiz conducted by the P.S.G. College of Technology, Coimbatore. I.I.T. was represented by M. Vikram Rao and R. Neelamegam. Soon after, the Institute added another feather to its cap when it retained the " Saturday Evening Club " Trophy for Inter-Collegiate Quiz. This time V. Venkatesan represented I.I.T. But perhaps, the major test came when the Institute had to send in its team for the Inter-Collegiate Debate at A. M. Jain College. This was for the " Shri Mohanmullji Chordia Rolling Cup ". S. P. Shukla and A. Kacker represented the Institute and won the trophy for the Institute.

At the Annual Literary Week, Dr. N. Klein's Trophy for Inter-Collegiate German Recitation was bagged by the Max Muller Bhavan when V. Dilipkumar stood first. Unfortunately this year, the Institute could not retain the Dr. M. V. C. Sastry's Rolling Trophy for the Inter-Collegiate Group Discussion — the A. C. College of Technology took it away from the Institute. Our Institute was represented by A. Kacker, G. Mahajan, G. Ramachandran, V. Khanna and S. P. Shukla. The Institute Trophy for the All-India Debate was taken away by the Medical College, Bengal. This was the first time this Rolling Trophy had gone out of Madras. The speakers from Calcutta were Mahabir Singh and M. G. Mukerjee. The first prize went to P. Chidambaram and the best Lady-speaker's prize to Sujaya Viswanathan, both of Law College. The second prize went to M. G. Mukerjee of the Medical College, Bengal. Mahabir Singh was placed third. I.I.T. was represented by A. Kacker and C. Camillus. We also had participants from A. V. U. College of Engineering, Tirupati. None of us, who attended the Inter-Collegiate Quiz for the Rao

Bahadur Ramachandra Iyer Trophy presented by Shri R. Natarajan, can forget the performance of Venkatesan, who seemed to know everything there is to know. M. C. Murthy was the second member of the Institute's team. The Institute team won the trophy with ease, but it must be remembered that it was won for the first time, previous winners being Engineering College, Guindy. The highlight of the Literary Week was the Inter-Collegiate Entertainment Competition for the Tropy presented by Prof. R. G. Narayanamurthy. As many as seven Colleges participated and I.I.T. emerged victorious — again for the first time. Dr. C. P. Ramaswamy Aiyar, Vice-Chancellor, Annamalai University, presided and gave away the prizes.

NATIONAL CADET CORPS

NCC Rifles was introduced in the Institute in the year 1960-61 with a strength of 204. Further Companies were added in the following years. In 1964, NCCR Companies were abolished and the following new NCC Technical Companies were raised :

Name of Company	*Strength*
6 Madras Engr. Coy. NCC	200
3 Madras Sig. Coy. NCC	200
6 Madras (Ele. and Mech. Engg.) Unit NCC (2 Coy.)	400

In 1965, 4 Madras Technical Air Squadron, with a cadet strength of 200 was raised.

Immediately after the admission of students, all those who are medically fit have to get themselves enrolled as cadets in one of the Units. As far as possible, the allocation to the Units is done in keeping with the branch of study chosen by the students. NCC training is compulsory for all students of the 1st, 2nd and 3rd years of the 5-year degree course and of the 1st and 2nd years of the 3-year degree course.

The training is given generally on two days in the week for two hours on each day. The cadets are given refreshments after the parade in their respective hostels themselves.

The training imparted covers military training and technical training. The military training comprises drill, rifle training, miniature range firing with .22 rifles and annual classification range with .303 rifles, map reading, night marches, field-craft, patrolling and ambush. The technical training covers operations and maintenance of the equipment, appropriate to the particular technical branch.

A separate new building is being built for all the NCC Units together to accommodate the officers, stores, demonstration

rooms, class rooms and Arms Kot. The building is expected to be ready for occupation early next year.

The cadets are given training in exercise such as " Free for all " on the same standard as cadets in Officers' Training Course. The cadets are also trained in Civil Defence, First Aid, Air Raid Precaution and Traffic duties. The cadets take a lively interest in the Grow More Food campaign and in planting trees in the campus. Attention to manual labour is given due importance in the NCC and the cadets have helped in the construction of a swimming pool in the campus.

The set up of officers of all cadres in the several Units is as follows :

Unit	Regular Army Officer	Regular Army Instructional Staff, JC O/Or	Part-time NCC Officer	Clerical staff
(1)	(2)	(3)	(4)	(5)
6 (M) Engr. Coy. NCC	1	5	2	7
3 (M) Sig. Coy. NCC	1	5	2	7
6 (M) EME Unit NCC	2	10	3	12

I. I. T. CO-OPERATIVE STORES LTD.

I.I.T. Co-operative Stores is now running into the third year of its business and it is gratifying to note that it is making a steady progress and slowly expanding its trade. A provision stores, as a branch of the co-operatives stores, was opened at the Shopping Centre in October 1964. It is contemplated to include the sale of the necessary items of provisions in the near future.

The Stores has made a profit of Rs. 6,018.65 during the year 1963-64 over a turnover of Rs. 71,634.00 (these figures are subject to audit by the Deputy Registrar of Co-operative Stores, Madras).

The number of members to this date is 1,046 with a paid-up capital of Rs. 10,460.

The General Body Meeting of the Stores was held on 3rd September 1964 when the following persons were elected as Directors for the year 1964-65 by secret ballot vote for the first time.

Prof. M. C. Gupta	..	*President.*
Dr. S. C. Das	..	*Vice-President.*
Shri C. V. Ramiah	..	*Hon. Secretary.*
Shri P. Poornanjaneya Sastry	..	*Asst. Secretary.*
Shri K. V. Ragavachari	..	*Treasurer.*
Shri E. M. Gopalakrishna Shri S. Sarathy Shri M. Krishnamoorthy Shri R. Ramachandran	..	*Directors.*

The figures given below will give an idea of the important business transaction carried out during the half year ending December 1964 :

From 1-7-1964 to 31-12-1964 —

Total Share Capital collected	..	Rs. 5,400.00
Entrance fees	..	Rs. 270.00
Total purchases made	..	Rs. 74,944.00
Total sale proceeds	..	Rs. 59,256.00

APPENDICES

APPENDIX I

PROCEEDINGS OF THE FIRST CONVOCATION OF THE INSTITUTE HELD ON THE 11th JULY 1964

The First Convocation of the Institute was held at 4-30 p.m. on Saturday, the 11th July 1964, at the open Air Theatre of the Institute. Dr. A. L. Mudaliar, Chairman, of the Board of Governors, presided over the Convocation. Dr. S. Radhakrishnan, President of India and Visitor of the Institute, was invited to be the Chief Speaker and to deliver the Convocation Address. Dr. Radhakrishnan arrived at the Institute accompanied by Shri Jaya Chamaraja Wadiyar, the Governor of Madras. On arrival at the campus, they were received by Prof. B. Sengupto, Director of the Institute and Shri R. Natarajan, Registrar of the Institute. A Guard of Honour was presented by the cadets of the N.C.C. The President took the salute from the dais specially erected opposite the Humanities and Science Block. After inspecting the Guard of Honour, the President drove to the robing room at the entrance to the Open Air Theatre where Dr. A. L. Mudaliar, Chairman, Board of Governors, received him. After robing, the President and the Governor were introduced to His Excellency Mr. Duckwitz, German Ambassador to India, who had specially flown from New Delhi to attend the Convocation, and the following members of the Indian Institute of Technology Council, Board of Governors and the Senate, who, later, in academic robes, formed the Academic Procession.

Dr. A. L. Mudaliar (Chairman, Board of Governors); Dr. G. F. Duckwitz (German Ambassador to India); Prof. B. Sengupto, (Director); Shri G. K. Chandiramani (Member of the Indian Institute of Technology Council); Dr. Raja Sir Muthiah Chettiar ; Shri P. M. Reddy ; Shri Mir Akbar Ali Khan ; Shri A. Abdul Rahim ; Dr. Y. Nayudamma ; Dr. M. V. C. Sastri ; Dr. E. G. Ramachandran (Members of the Board of Governors); and Shri R. Natarajan, (Registrar/Secretary, Board of Governors).

Dr. G. Laddha ; Prof. T. Balakrishnan Nayar, Prof. R. G. Narayanamurthi ; Dr. G. Stahl ; Dr. Lutz ; Dr. K. W. Haug ;

Dr. Heitland ; Dr. S. Seinecke ; Dr. P. Venkata Rao ; Prof. S. Sampath ; Dr. P. C. Verghese ; Dr. S. Ramaseshan ; Dr. D. Venkateswaralu, Prof. R. Krishnamurthi, Prof. R. K. Gupta, Dr. S. D. Nigam (Members of the Senate.)

The Academic Procession proceeded in twos to the Convocation Hall with Shri R. Natarajan, Registrar, leading. On the President entering the Convocation Hall, six bars of the National Anthem were played by the I.A.F. Band which was in attendance. Then the members of the procession proceeded to the dais and took their seats.

After invocation, Dr. A. L. Mudaliar, welcomed the President, the Governor and Dr. Duckwitz. Dr. Duckwitz also spoke on the accasion. The welcome address of the Chairman and Dr. Duckwitz's speech may be seen in Annexures I and II to this Appendix.

The Chairman then declared the Convocation open. The Heads of Departments supplicated one by one in the following order for the passing of the Grace.

Dr. S. D. Nigam, Professor of Mathematics.	M.Sc. Degree in Mathematics.
Dr. S. Ramaseshan, Professor of Chemical Engineering.	M.Sc. Degree in Physics.
Dr. D. Venkateswarlu, Professor of Chemical Engineering.	B.Tech. Degree in Chemical Engineering.
Dr. P. C. Varghese, Professor of Civil Engineering.	B.Tech. Degree in Civil Engineering.
Dr. P. Venkata Rao, Professor of Electrical Engineering.	B.Tech. Degree in Electrical Engineering.
Prof. R. G. Narayanamurthi, Professor of Mechanical Engineering.	B.Tech. Degree in Mechanical Engineering.
Dr. E. G. Ramachandran, Professor of Metallurgy.	B.Tech. Degree in Metallurgy.

The Chairman put the question 'Doth it please you that this Grace be passed' to the members of the Board of Governors and the Senate after supplication for Grace by each Head of the Department and with the members assenting, the Grace was passed.

After the passing of the Grace, degree and departmentwise, the first candidate in the concerned branch of study was presented by the Head of the concerned Department to the Director who conferred the Degree on him and other students taking the Degrees in person. He also conferred the Degrees *in absentia* on those candidates who could not take the Degrees in person.

The number of candidates on whom the Degrees were conferred in person and the number on whom the Degrees were conferred *in absentia* are as follows:—

	In person	*In absentia*	*Total*
M.Sc. Degree			
Mathematics	5	—	5
Physics	9	1	10
B.Tech. Degree			
Chemical Engineering	10	1	11
Civil Engineering	13	3	16
Electrical Engineering	16	8	24
Mechanical Engineering	18	10	28
Metallurgy	9	4	13
Total	80	27	107

After the conferment of the Degrees, the Registrar presented the following graduates for the award of the Prizes.

PRESIDENT'S PRIZE : For the best student of the B.Tech. Degree Course.

Shri S. R. Thangavelu—Mechanical Engineering.

GOVERNOR'S PRIZE : For all round proficiency in B.Tech. Degree Course (curricular and extra curricular).

Shri S. Gopalakrishnan—Mechanical Engineering.

INSTITUTE MERIT PRIZES : For the best student in each Discipline.

(a) *M.Sc. Degree*

Shri B. Nagabhushanan—Mathematics.
Shri T. M. Haridasan—Physics.

(b) *B.Tech. Degree*

Shri P. S. Krishnamurthi—Chemical Engineering.
Shri B. S. Sudhirchandra—Civil Engineering.
Shri G. N. Sarma—Electrical Engineering.
Shri S. R. Thangavelu—Mechanical Engineering.
Shri R. Natarajan—Metallurgy.

The Chief Speaker graciously handed over the prizes.

The distribution of prizes being over, the new graduates took the following pledge which was read out by Shri S. R. Thangavelu, winner of the President's Prize.

" We, the graduates and post-graduates of the Indian Institute of Technology, Madras, hereby pledge :

That we will, in thought and deed, ever endeavour to be scrupulously honest in the discharge of our duties as engineers, technologists and scientists :

That we shall ever endeavour to utilise our knowledge of science, engineering and technology for the service of our country and honour of our Institute ; and

That in all circumstances we will uphold the dignity and integrity of the profession."

सहनाववतु सहनौ भुनक्तु सहवीर्यं करवावहै ।
तेजस्विनावधीतमस्तु । मा विद्विषावहै ।
ओं शान्तिः शान्तिः शान्तिः

Sahanavavatu, Saha Nau Bhunaktu,
Saha Viryam Karavavahai,
Tejasvinavadhitamastu, Ma Vidvishavahai
Aum Shantihi Shantihi Shantihi.

Then the President (Chief Speaker) delivered the Convocation Address, on being requested by the Chairman to do so. The Address by the President is furnished in Annexure III. On the conclusion of the Address, the Chairman signed the Record of Degrees conferred and declared the Convocation closed. After the playing of the National Anthem, the members of the academic procession then descended from the dais and proceeded out of the Convocation Hall in procession of twos, the Registrar leading. The President and the Governor then left the Institute.

ANNEXURE I TO APPENDIX I

Text of Welcome Address delivered by Dr. A. L. Mudaliar, Chairman, Board of Governors, on the occasion of the First Convocation of the Indian Institute of Technology, Madras, on the 11th July, 1964.

Hon'ble President, Your Highness, Mr. Director, Ladies and Gentlemen :

It is my privilege as it is, undoubtedly, a source of great pleasure to me, to welcome the Hon'ble President to this, the first Convocation of the I.I.T. To your Highness, (the Governor of Madras) we are deeply grateful in more ways that I can say. That I will reserve for a later occasion.

Sir, it was in the year 1956 when our late, lamented and dear Prime Minister was in Germany, the German Government came forward generously to offer substantial help to one of the Indian Institutes of Technology, and as you may remember, there were to be, at first, four institutes of this kind, in the north, south, east and west. The Prime Minister readily accepted this generous offer and this Institute owes not a little to the German Government for the rapid progress that it has made and for the excellent manner in which things have turned out, so that I am in a position now to say that the first milestone has been reached with the first Convocation to be held to-day.

May I, in this connection, briefly recount the history of this Institute ? It was in the year 1959, that the then Minister-in-Charge of Scientific and Industrial Research, my esteemed friend,

Mr. Humayun Kabir came and opened this Institute. At that time, the Institute was situated in hired buildings, partly those of the University of Madras and partly those of the adjacent Central Leather Research Institute. It was also after some negotiations that it was possible to locate this Institute in the City of Madras to serve the needs of the southern region, comprising the four States of Kerala, Mysore, Andhra and Madras.

Your Highness, to you and to your predecessors, we owe not a little for the fruition of our labours. They generously gave us about 300 acres of land from the Government House estate while the Government of Madras came forward with another 300, acres from the neighbouring villages, besides agreeing to supply the necessary electric power and water resources for this Institute. The Raj Bhavan, next door, and we have been on very good neighbourly relationship — so much so that even the fauna of these two estates happen to meet occasionally — the deer jumping over their walls and coming here and our snakes going on to relieve the monotony of the Raj Bhavan.

Apart from this, the German Government came forward with a generous gift of equipment of the order of Rs. 180 lakhs, which we have received almost in entirety. What is more significant is that they readily agreed to send a large number of their well-trained Professors to guide us in the early stages of this Institute. Not only that; they have also given the opportunity for many of our teacher-trainees to go to Germany and learn in their Institutes something of what is required to give a polishing touch to their education.

It is under these circumstances, Hon'ble President, that we were able to proceed with the offer that was made by the Government of India, through the Ministry of Scientific Research and Cultural Affairs — as it was then called — of a sum of Rs. 10 crores for construction of buildings, equipment and provision of the necessary resources for this campus — a campus of 650 acres. We have here, almost completely, every amenity that can be expected of a satellite city. It would be useful for those who think of satellite cities, to come and see our campus and realise what is meant by satellite cities. We have hostels for all the students, because this is a completely residential institute.

We have quarters for all the Professors, Readers, Lecturers ; we have quarters for all those who assist us — class IV officers upwards. Almost everybody resides in the campus and we are happy it is so. Naturally, with such a large population of over ten thousand, we had to think of the amenities that were required and I can assure you that those amenities have been increasingly found for the sake of those who are living here. We have shops, where the ladies can spend a good deal of their spare time ; we have provision stores ; we have various amenities for the men ; we have a community centre ; we have a club for the ladies and one for the officers and we have also got schools — a primary school and a secondary school coming up separately for boys and girls. As I have visualised this from year to year and seen the progress, I can only say it has been fantastic the way in which buildings have come up. I do hope that in the future when the whole project is completed, this will be a centre which will attract the attention of many tourists, not only because of its surroundings but also because of the teaching and the standards that are being maintained here.

This is the first Convocation of its kind, and we are grateful to you, Sir, as President, in your capacity as Visitor, having a wide control over us — if you choose to exercise that control — for coming to us and spending a few minutes in addressing the graduates of the year. We have not only graduates passing out in Mechanical, Electrical, Civil, Metallurgical and Chemical Engineering, but also post-graduates passing out in Mathematics, Physics and Chemistry so essential for any institution of technology, especially for one where higher research and post-graduate training are the main aim. You will see some of those candidates who will be presented to you shortly.

Finally, Sir, I can say that the manner in which this Institute has come up is due to the unfailing and untiring energy devoted by the Director and the staff, to their good work and to the remarkable manner in which the students — both undergraduate and post-graduate — have conducted themselves here. I hope this will be an example for other institutes. And while we do not say that we are envious of any other institution we are anxious that there should, naturally, be a certain amount of

— shall I say — competition with the other institutions in what is the best from of instruction.

It may interest my listeners to know that the four higher institutions that have been established have been associated with a particular advanced nation in technology. This Institute owes itself to Germany.

The Institute in Bombay is under the auspices of the UNESCO, with active participation by Russia. The Institute at Kanpur owes its existence to American help and the one at Delhi to British endeavour. The Kharagpur Institute, the oldest of its kind, has been helped by many.

I hope and trust a day will come when we shall compare those results and see what is the best method for giving training to our engineers and technologists such training as will give them an incentive for research and forward movement.

Sir, it is with these words, that I once more welcome you Sir, Hon'ble President and your Highness and the distinguished audience that has come here. I now propose that the rest of the proceedings be taken up.

ANNEXURE II TO APPENDIX I

Text of speech delivered by Dr. G. F. Duckwitz, Ambassador of the Federal Republic of Germany in India, on the occasion of the First Convocation of the Indian Institute of Technology, Madras, on the 11th July, 1964.

Your Excellency Mr. President, Your Highness, the Hon'ble Chairman of the Board of Governors, Mr. Director and staff of the Institute, students, ladies and gentlemen:

Let me thank you for your kind invitation to attend the first Convocation of the I.I.T., Madras which I have accepted with much pleasure. This day is indeed a land-mark in the life of the Institute and a day to remember for you and me. The combined efforts of India and Germany to establish this Institute have at last borne fruit. The first batch of students

have completed their education and are leaving the Institute to assume their responsibilities in the industrial development of their country.

It is only natural that our minds wander back to the day in 1959, when this first batch of 120 students entered the Institute. They had to study under very difficult conditions. Most of the buildings had not yet been completed and many of the laboratories and workshops had not been installed. The teaching had to take place in rented rooms in various other institutions in Madras. What a tremendous progress has been made since then, the progress which, in 1959, one would hardly have thought possible ! The credit for the enormous construction and organisational work that has since been completed goes to the unremitting zeal and energy which, you, Mr. Sengupto, had brought to your task, as Director of this Institute. I should like to thank you and your colleagues for the whole-hearted co-operation you have given, without which, this Indo-German project would not have reached this successful stage. At the same time, I should like to thank our German Professors and Foremen, for having contributed equally to the progress of the I.I.T., for setting up workshops and laboratories and by imparting to the students, their experience and technical know how. However, let me add that the time has not yet come when we can sit back and satisfy ourselves with what has been achieved. Undoubtedly, a lot remains to be done. A multitude of problems have still to be tackled. New tasks lie ahead in connection with the extension of the Institute, which is at present being discussed between the Indian and the German Governments.

Nevertheless, I firmly believe that all problems can be solved if we continue to co-operate with goodwill, patience and understanding for each others' problems. I am confident that we will all do our best and succeed in making this Institute what it was intended to be when the assistance for this project was offered to the late Prime Minister, Mr. Nehru in 1956. That this Institute is of reputed high standard, is beyond doubt. To the students, it imparts not only theoretical text-book knowledge, but also practical workshop experience.

In conclusion let me say to you, the first batch of young Indian engineers, that it is a proud and happy day for me to be here today in your midst, to watch you receive your diplomas and take the opportunity to wish you a bright and successful future.

I cannot stress enough the important role you have to play in the onward march of your country, a role to which you have to devote the same enthusiasm and fervour that you brought to your academic studies. For any country to progress, it is necessary to have a strong, intelligent, educated and dedicated group of young people, who are fully equipped to undertake the great tasks that lie ahead. I am confident that you are also equipped and wish you good luck and godspeed!

May I add to my few words, a message I just have received, Mr. President, from the President of the Federal Republic of Germany?

"It gives me great pleasure to congratulate the Professors and students of the I.I.T., Madras most cordially on the occasion of their first Convocation. Ever since my visit in December 1962, I have been closely connected with this Institute. It is our common desire that this day further strengthen the tradition of scientific co-operation, so beneficial to India and Germany. I specially send my best regards to President Radhakrishnan who, I hear with pleasure, is lending his presence to this Convocation."

ANNEXURE III TO APPENDIX I

Text of Dr. S. Radhakrishnan's speech at the First Convocation of the Indian Institute of Technology, Madras held on 11th July, 1964.

Friends,

I am very happy to be here, this afternoon, to see the work of this Institute of Technology and meet the first batch of students going out of this Institute. I was present on similar occasions at Kharagpur and Bombay. It gives me especial pleasure to be here and watch the growth of this Institute. I am also pleased

that this work is due to the collaboration of the Indian and the German Governments. Prof. Luebke, the President of the German Republic sent us a gracious letter today ; he was recently re-elected President of the Federal Republic of West Germany and we are all extremely pleased that his Government and his country and this Institute will all have the benefit of his guidance and leadership for another five years. By that time, I hope this Institute will establish itself, so as to make for enduring friendship between the two nations — the German and the Indian. Both your Chairman and the German Ambassador referred to the history of this Institute beginning with a visit which the late Prime Minister paid to Germany in 1956.

Our country has been passing through a series of very rapid changes in recent times. We have had religious reforms initiated, in our times, by Ram Mohan Roy, Ramakrishna, Vivekananda and Tagore. We have had social reform movements started also by the same agencies. Gandhiji gave us the political revolution. He asked us to shed off the shame of subjection, become independent, and stand erect on our feet and not always walk on our knees. In 1947, when we attained independence, Jawaharlal Nehru thought it was time for starting an industrial revolution. Poverty is the greatest problem facing the country and the only way in which we can tackle the problem of poverty, is by increasing production-agricultural and industrial and the way to do it, is by the application of science and technology. If today, in different parts of our country, we see dotted Institutes like this, laboratories, dams, atomic reactors and irrigation systems, all these things are due, to no small extent, to the urge which Jawaharlal Nehru gave to our country In recent times, therefore, we have had a spiritual revolution, a social revolution, a political revolution and an industrial revolution. It is the industrial revolution through which we are passing. Now, this has the benefit of the co-operation of the German Government. This country during its great days was never isolated : It was a part of the stream of world history. If you turn to the ancient systems of Mathematics, Medicine etc. you will find there, the great influence of the Greek, of the Roman, of the West Asian and other systems. If you turn to the European world, you will find that the great advances of science were due to the co-operation of

people, like the Englishman Newton, the German Kepler, Copernicus the Pole and Galileo, the Italian. All of them collaborated and brought about the scientific revolution of the modern world. So also, we were collaborating with other nations in our great days. When we fell into subjection, when we were cut off from other sources, we became isolated, our lives became constricted and we were not able to carry on the torch as we used to.

After political independence was gained, we have, again, come back into the mainstream of world history and our scientists go to different parts of the world and win laurels, for themselves, making no small contribution to the advance of knowledge. They are known today, in all parts of the world, where science is pursued ; and, therefore, it is a matter of great significance, that we have staged a come back and this particular Institute, where you have the collaboration between Germany and India, is an illustration of the ancient truth that all countries contribute to the furtherence of knowledge and that we must seek knowledge wherever it is found. That was the gospel which we adopted and which we practised for a large number of years. We forgot it ; we were cut off from it ; and we have come back to it today, and therefore we must try, today, to regain our lost initiative, and try to do our very best.

It is necessary that we attack the problems which our country faces — poverty, malnutrition, disease, defective water-supply, etc. things which must make us feel ashamed of ourselves. It is necessary for us to care for the poor. Attention to the poor is the supreme test by which any Government is judged. If we are to be judged as a civilised Government, our first interest must be what we are doing for the thousands of people who are suffering from undreamt of evils, people who are the victims of all sorts of epidemics and die on the pavements of our country or in rural areas. If we want to tackle those problems, it is essential for us to develop science and technology. We must adopt a scientific outlook. Every one of us must be endowed with a scientific spirit and obscurantism, superstition and such other things as have weighed us down for centuries must be removed and human beings must feel they are rational beings endowed with dignity and with a sense of responsibility — responsibility not merely for what they do, but for the poor who are

entrusted to their particular care. Again and again remarks are made — a special lecture was delivered the other day at Cambridge — saying that a scientific culture and an academic or literary culture were two different things and one has little to do with the other. We produce either seers or technicians, we produce men of intuition, of imagination or produce men with mechanical skill, with practical ability ; but we do not produce men who are, at the same time, both seers and technicians ; people able to develop their imagination and, at the same time, develop their scientific skill. This whole concept of our cultures being divided, of their being two, is something, to my mind, which is unfounded. Truth is indivisible — whether it is historical truth, literary truth or scientific truth — the approaches may be different. But, ultimately what we do is exactly the same. It is the imagination that is roused in us by the study of literature. It is imagination again that makes the scientist go forward with his hypothesis, makes him re-mould his environments and makes him bring out the deepest secrets of nature. It is this spirit in man that sits in judgment over the facts of nature and enables him to re-shape his environment. We should re-shape not merely our outer environment, but our inward environment also. Our inward forces, the internal power that we have — even that has to be remoulded.

I listened, with great interest, to the pledge which your graduates have just taken — that " I will not use my knowledge for unworthy ends ". It is easy to say that. We have all said that at convocation ceremonies. But, we, generally, forget these things when we enter life. Not only do we forget these things but our leaders also forget it, leaders who are, otherwise, great as statesmen, or men who have developed astounding powers over Nature, or have developed a spectacular capacity to destroy humanity as well as to save it.

If we are threatened today by the very forces which we have created, it is not due to these forces, but due to our lack of control over them. It is not weapons that destory us, but it is the lack of wisdom, it is the inhuman being who destroy the rest of humanity. If we are to refine ourselves, then science will have to be a positive instrument for the development of the

human race, for improvement of its quality. That is what we should aim at. It, therefore, gives me great pleasure to know that in your institution, you are studying not merely technological subjects, but also the fundamental Science and Humanities. These are subjects that have a great bearing on the refinement of the human soul. These are the things that remould your nature — *Athma Samskrithinava Silpani* — All the technical disciplines which you have are there only for the purpose of refining the human spirit — *Athma Samskriti* — the development of human nature. The refinement of the human spirit is the only supreme aim which we have to put before ourselves. Most of us think that we are scientists? Why? Because if we press a button, the light comes up; we press another button and the telephone rings; we press a third button and get a motor car parked outside. But we do not know how these things function. What is the knowledge which is eashrined in these instruments? We know only how to press a button and get something done — we live only on the surface of human life. We do not know what these things indicate and stand for. If we will never say that science is a discipline different from others like literature or history, we must study science not from surface but its very depths we must try to understand that how the human mind has been able to penetrate into all these mysteries of matter? How has it brought about a new transformed world? It is not necessary for us to be technologically or mechanically uniform. If we have the human spirit cultivated, we will not become mere mechanically-minded robots. The very transformation which science has brought about will make you raise the question of the meaning of existence. That is a part of the quest for knowledge. You have to know why knowledge is, what it is, what is the knowledge which science contributes? What is its relation to the knowledge which other disciplines give? All the branches of discipline have the same end — *Sarva Sastra Prayojanam — Athma Darsanam.* Insight into reality is the end of all kinds of discipline, whether they are scientific or humanities or technological — It is my earnest hope that you will not fall victims to the tendency to view science and humanity as two diversified disciplines and feel that you are engaged in two different and unrelated pursuits.

All truth must be regarded as one whole — whether you practise this discipline or that. Your supreme aim must be to pursue Truth. It is that which makes the human being dignified and civilised. If you are able to do it, then you became a really civilised human being. It is my earnest hope that this first set of graduates who go out from this Institute of Technology will set an example to others in never using their knowledge to unworthy ends but using it for the betterment of humanity for the education of the human race and for making this world a true human fellowship.

Thank you !

APPENDIX I-A

PROCEEDINGS OF THE SECOND CONVOCATION OF THE INSTITUTE HELD ON THE 3rd APRIL, 1965.

The Second Convocation of the Institute was held at 5-00 p.m. on Saturday, the 3rd of April 1965, at the Open Air Theatre of the Institute. Dr. A. L. Mudaliar, Chairman, Board of Governors, presided over the Convocation. Shri M. C. Chagla, Union Minister for Education, who was invited to be the Chief Speaker delivered the Convocation Address.

On arrival at the campus, Shri Chagla was received by Prof. B. Sengupto, Director and Shri R. Natarajan, Registrar, of the Institute. A Guard of Honour was presented by the cadets of the N.C.C. After inspecting the Guard of Honour, the Minister drove to the robing room at the entrance to the Open Air Theatre where Dr. A. L. Mudaliar, Chairman, Board of Governors, received him. After putting on the academic robes the Chief Speaker sat for a group photo with the candidates taking their Degrees and with the members of the Council, Board of Governors and the Senate, all of them being in academic robes.

The Director introduced the members of the Council, the Board of Governors and the Senate to the Chief Guest after the group photo. The following members of the Council, the Board of Governors and the Senate formed themselves into the Academic Procession in twos with the Chief Guest, the procession being led by the Registrar, Shri R. Natarajan.

Shri R. Natarajan

Prof. R. K. Gupta
Dr. E. Hohmann
Prof. S. Sampath
Dr. G. Rouve
Prof. R. Krishnamurti
Dr. H. Heitland
Dr. S. R. Valluri
Dr. W. Scheer
Dr. G. S. Laddha
Dr. C. Ramasastry
Dr. S. D. Nigam
Dr. F. W. Lohr
Dr. D. Venkateswarlu
Dr. W. Lutz
Dr. P. C. Varghese
Dr. N. Klein
Dr. P. Venkata Rao
Dr. G. Stahl

Dr. W. Koch	Prof. R. G. Narayanamurthi
Prof. T. Balakrishnan Nair	Dr. E. G. Ramachandran
Dr. M. V. C. Sastri	Shri A. Abdul Rahim
Shri S. Rajaraman	Dr. Y. Nayudamma
Shri G. K. Chandiramani	Shri Mir Akbar Ali Khan
Prof. B. Sengupto	Dr. Raja Sir Muthiah Chettiar
Shri M. C. Chagla	Dr. A. L. Mudaliar

On the Chief Guest first entering the Convocation Hall, six bars of the National Anthem were played by the Police Band which was in attendance. The members of the procession proceeded to the dais and took their seats.

After invocation, Dr. A. L. Mudaliar, Chairman, Board of Governors, welcomed the Minister and declared the Convocation open. His speech is given in Annexure I to this Appendix.

The first Degree to be conferred was the Ph.D. Degree for which three candidates had qualified themselves for the first time in the history of the Institute, two in Mathematics and one in Physics. Dr. S. D. Nigam presented the two candidates in Mathematics after which Dr. C. Ramasastry presented the candidate in Physics. Before presenting each candidate, the Head of the Department concerned supplicated for the passing of Grace which was passed after the members present on the dais assented to the question by the Chairman " Doth it please that this Grace be passed ? ". The candidates were then individually presented for the award of the Ph.D. Degree.

The Director conferred the Ph.D. Degree on each candidate thus presented.

Candidates for the B.Tech. Degree were then presented. The Heads of Departments supplicated one by one in the following order for the passing of Grace.

Dr. D. Venkateswarlu, Professor of Chemical Engineering.	Chemical Engineering Branch.
Dr. P. C. Varghese, Professor of Civil Engineering.	Civil Engineering Branch.

Dr. P. Venkata Rao, Professor of Electrical Engineering.	Electrical Engineering Branch.
Prof. R. G. Narayanamurthi, Professor of Mechanical Engineering.	Mechanical Engineering Branch
Dr. E. G. Ramachandran, Professor of Metallurgy.	Metallurgy Branch.

The Chairman put the question, 'Doth it please you that this Grace be passed?' to the members of the Board of Governors and the Senate and with the members assenting, the Grace was passed.

After the passing of the Grace for each Branch, the Head of the Department concerned presented the first candidate for the B.Tech. Degree in his branch to the Director who conferred the Degree on him. Similarly the Director conferred the Degrees on the other candidates of the Branch one after another. He also conferred the Degree *in absentia* on those candidates who could not take the Degree in person. The Diploma was handed over by the Director to each candidate when presented by the Head of each Department.

The number of candidates on whom Degrees were conferred in person and the number on whom Degrees were conferred *in absentia* were as follows:—

	In Person	*In absentia*	*Total*
Ph.D. Degree			
Mathematics	2	—	2
Physics	1	—	1
B.Tech. Degree			
Chemical Engineering	9	9	18
Civil Engineering	5	10	15
Electrical Engineering	14	16	30
Mechanical Engineering	25	10	35
Metallurgy	11	6	17
Total	67	51	118

After the conferment of the Degrees, the Registrar presented the following graduates to the Chief Speaker for the award of the prizes to the students of the B.Tech. Degree Course.

PRESIDENT'S PRIZE : For the best student of the B.Tech. Degree Course.

Shri C. R. Muthukrishnan — Electrical Engineering.

GOVERNOR'S PRIZE : For all round proficiency in B.Tech. Degree Course (Curricular and extra-curricular).

Shri Basu John Vetteth — Mechanical Engineering.

INSTITUTE MERIT PRIZES : For the best student in each Discipline.

Shri R. V. S. Mani — Chemical Engineering.
Shri K. M. Kripa Narayanan — Civil Engineering.
Shri C. R. Muthukrishnan — Electrical Engineering. (HC).
Shri Ramesh A. Vaswani — Mechanical Engineering.
Shri M. Narayanan Kutty Menon — Metallurgy.

SIEMENS PRIZE : For the best student in Electrical Engineering Branch.

Shri Kanianthra Mani Chandy — Electrical Engineering (LC).

The Chief Speaker graciously handed over the prizes.

After the distribution of the prizes, the new graduates took the following pledge which was read out by Shri C. R. Muthukrishnan, winner of the President's Prize:

"We, the graduates and post-graduates of the Indian Institute of Technology, Madras, hereby pledge:

that we will, in thought and deed, ever endeavour to be scrupulously honest in the discharge of our duties as engineers, technologists and scientists:

that we shall ever endeavour to utilise our knowledge of science, engineering and technology for the service of our country and honour of our Institute ; and

that in all circumstances we will uphold the dignity and integrity of the profession."

सहनाववतु सहनौ भुनक्तु सहवीर्यं करवावहै ।
तेजस्विनावधीतमस्तु । मा विद्विषावहै ।
ओं शान्तिः शान्तिः शान्तिः

Sahanavavatu, Saha Nau Bhunaktu,
Sahaviryam Karavavahai,
Tejasvinavadhitamastu, Ma Vidvishavahai
Aum Shantihi Shantihi Shantihi.

Then the Chief Speaker delivered the Convocation Address, on being requested by the Chairman. His Address is contained in Annexure II to the Appendix.

On the conclusion of the Address, the Chairman signed the Record of Degrees conferred and declared the Convocation closed.

After the National Anthem, the members of the academic procession descended from the dais, re-formed themselves into a procession in the same order in which they entered the Convocation Hall and returned to the robing room with the Registrar leading.

ANNEXURE I TO APPENDIX IA

Text of the Welcome Speech delivered by Dr. A. L. Mudaliar, Chairman, Board of Governors of the Institute, on the occasion of the Second Convocation.

Members of the Council, Mr. Director, Members of the staff and students, Ladies and Gentlemen,

It is my privilege today, to welcome the Hon'ble Minister of Education, Mr. Chagla, into our midst. This is the first time that he is visiting the I.I.T., and we are all happy that it happens to coincide with the Second Convocation of this Institute. As you are doubtless aware, on the first occasion, we had the Hon'ble the President, Dr. S. Radhakrishnan to deliver the Con-

vocation Address ; and it is but fitting that on this occasion, we have been able to secure your services, Sir, to deliver the Second Convocation Address.

It is unnecessary for me — in fact it would be mere impertinence on my part — to introduce the Hon'ble Minister to any of the audiences in India, more particularly in Madras. We have known him and we have known of his great reputation in many fields of national activities in which he has participated. As the Chief Justice of the Bombay High Court, as an Ambassador of our land to various countries, as one of the illustrious men who espoused the cause of India at the United Nations, he has won laurels everywhere and has earned the grateful appreciation of his countrymen.

This, Sir, is the sixth year after this Institute was started and I hope it will be possible for you during your short stay with us to have something of a glimpse of this Institute which has grown up into a city. Much of this is due to the untiring exertion of the Director and his staff. I am happy to say that at present we have started well on the way to progress in many lines of technological activity. Today we shall be presenting to you Sir, those who have taken the higher degrees in technology. We shall also be presenting the graduates who are to take their degrees here.

I once more extend to you, Sir, a most cordial welcome and hope that your short stay now will only be a precursor for a much longer stay when you have more time at your disposal to spend with us.

Thanking you.

ANNEXURE II TO APPENDIX IA

Text of the Address delivered by Shri M. C. Chagla, Union Minister for Education, on the occasion of the Second Convocation.

Mr. Chairman, Mr. Director, Ladies and Gentlemen,

It is a great privilege to have been asked to deliver this Second Convocation Address and I realise how unworthy I am, considering the fact that I am succeeding no less a person than that of the President of India. I am sure that the good wishes he must have conveyed to you on that occasion, have come to fruition, because what I have been seeing of this Institute, makes me sure that tremendous advance has been made in the course of the last year and that there are tremendous potentialities for growth and expansion.

Now, Ladies and Gentlemen, Technology, if I may give a definition which is not technical, is the acquisition of the art of the utilisation of science. Science has made such tremendous progress in the last few years that we are beginning to realise that science is not merely knowledge, not merely advancing the horizon of knowledge, but that it can be put to use for the benefit of the people for raising their standards of living and for making good life possible.

It is often thought that technology is purely western. It is true that when the industrial revolution started in Europe, we did not take any benefit out of it, because we were then under colonial rule and we were not a free country. But it is entirely a mistake to say that we had no technological traditions in the past. As you know, in ancient India, technology had very much advanced. In Mohenjadaro, you find evidence of town planning, civil engineering and architecture. I understand that the Rig Veda speaks about canals and lakes ; and steel was produced when Alexander invaded India. Therefore, we have these traditions : we lost them in what I might call the dark ages in India ; and today we are trying to revive not only our past glory, but to catch up with the technological revolution that is going on all over the world.

It is worthwhile considering why there was a decline in our country in the study of technology or science as compared to what was happening in the world outside and I might suggest for your consideration a few reasons. The first is, perhaps, the most important. Although in ancient India society might have been divided on functional basis, later on this became stultified with the result that a profession was followed not because a person was suited for it, but because of his birth. In other words, the birth of a person determined his profession or his vocation or what walk of life he should tread. The second reason was that we attached too much importance to the intellect, to the things of the spirit and very little to the dignity of labour. It was not only true of India. Plato has somewhere said that manual labour came in the way of intellectual advancement and the acquisition of culture. The Greeks had somewhat of a similar idea about the demeaning quality of manual labour. You cannot have advance in technology if you did not give to labour the dignity to which it is entitled.

Then, in the British times, we attached too much importance to what I might call "formal education", and "academic excellence". I do not minimise the importance of formal education: I do not minimise the importance of academic excellence. But the study of science and technology was neglected. The reason largely was that the British Government was not interested in technological advancement in this country. They were more interested in having administrators or professional men and the Universities were so geared that such men were produced through the necessary academic learning. The result was that when we became independent and that not so far ago, we found ourselves far, far behind the world that had made tremendous strides in technology. It is hardly necessary for me to emphasise how important technology is in this country.

What purpose should technology serve in our country? The first and the most important purpose of technology, as I see it — and I am speaking purely as a layman — is that technology should help us to produce more. The one great need in India today is the need for more production. We are living in a society of scarcity. We want our country to become a society

of abundance. All the economic problems and evils that we see around us — rising prices, unemployment, sense of frustration — are all attributable to a large extent to the fact that we live in a society of scarcity, that we do not produce enough and that if we are going to tackle these problems, we should produce more. What is the difference between this country and the U.S.A. ? It is not as if we have no talent. It is not that we have not got the necessary materials or equipment. The main difference is that the United States, by reason of having a tremendous start in technology, has become today a great society of producers and if we have to achieve the same results, we have to produce more. But it is equally important that in trying to produce more we have to use our own materials. There is no country in the world today, which is richer in its own materials in its own natural produce, than our country. We have minerals, we have coal and iron, we have mighty rivers, we have different climates that help us, we have the diversity in various things, we have manpower, so that there is hardly anything that is lacking.

I was reading the other day a recent publication, Biography of Montague, who was the Secretary of State for India years ago, and I was interested to read as to what his judgment was about this country. What he said was : " Here is a very rich country where very poor people live ". We are a rich country, but the people are poor. Why ? Because we have not yet learned how to utilize our riches for the good of our people. Equally important in my opinion is that technology should teach us to create our own know-how. I am very impatient, almost indignant, with people who do not trust our own scientists and our own technologists, who always turn to western countries or other countries in order to borrow their know-how. I have no doubt in my mind at all that if confidence were shown in our young men, we will be able to produce all the know-how that is required. Know-how necessitates designing and fabricating of plants and machinery. Today we are entirely or largely dependent upon foreign countries. But that dependence is gradually disappearing. I have been to various scientific and technological institutions and I have been thrilled and excited to see how many plants have been set up and built entirely by our own technologists. We

are politically independent. We want to be economically independent ; but it is equally important that we should be technologically independent. Our dependence on foreign countries is like the fate of the man, who always wants to walk on crutches. The time has come when we should throw away these crutches and stand on our own feet.

The other important point I wish to place before you is the establishment of relationship between manpower needs and technology studies. We do not want to turn out engineers in order to add to our educated unemployed. I am so happy to see all these young men qualifying in various disciplines in engineering. We must be sure that all these engineers will find employment. We are not a totalitarian country ; we are a democracy. In a totalitarian country, the Government can say ' you shall study this ' or ' you shall not study that '. We cannot do that. Democracy means free choice and you must give free choice to our students to decide what they will study. But even in a democracy, planning of manpower is necessary. Therefore, we have to take stock of how many engineers we will need, for instance, in the next five years and in what departments of engineering. Then we should admit the proper number who can be employed and whose services will be necessary as soon as they received the necessary training. That I think can be easily done. Each department can say we will take so many, the best from our all-India examination. Then other students can go to other departments. Thereby you will not only provide the necessary engineers which our technological advance requires, but will also provide the right type of engineers who will fit into the various sectors which require engineering skill.

I am very much interested in there being a closer collaboration between this Institute and Industry. After all, this Institute exists and we train engineers in order to industrialise our country, in order to push ahead with our economic plans and programmes. Therefore it is essential that institutes like this should not function in vacuum and there should be the closest collaboration between institutions like this and Industry. Industries are shy when it comes to research, shy both financially and psychologically. This Institute should find out from Industry what their

problems are ; what help they want and the students here should do research not only in this Institute, but also if it is possible, by going to these industries and helping them to solve their technological problems. I equally expect Industry to get over their shyness and to come to institutes like this with their problems, asking for a solution, which I am sure, an Institute like this will be able to give.

The next aspect of our technological education is the great need for technicians in this country. Although we have pushed ahead with these wonderful institutes and we are turning out a large number of engineers, it is equally important that we should train technicians at a lower level. One American of great distinction once told me that he was surprised how in India engineers manned jobs which were really intended for technicians and there was a tremendous waste of talent. He told me that it would be unthinkable in the U.S. for engineers to do the work which engineers do in this country and, therefore, there is a great need for technicians at the intermediate or lower level. For that purpose, we in the Education Ministry are doing what we can to diversify our education at the secondary school stage, to set up junior technical schools and also to establish polytechnics. There again, I do not know whether a certain amount of collaboration may not be possible between this Institute and institutes which will be producing technicians, at an intermediate or lower level.

In my opinion, the engineer in society to-day should have a very high status. In the U.S.S.R. the scientist and the engineer are given the highest status and, perhaps, the highest salary. That is a just recognition of the importance of scientists and technologists. But it is necessary to remember that an engineer should not be just an engineer, but he should also be a good citizen, that he should be conscious of his country's needs, its social philosophy, its cultural legacy and, therefore, I am glad that in this Institute you are taught not merely Science and Technology, but also Humanities. If an engineer has to become the leader of society, if he wishes to serve the social needs. then he must be familiar with his country's past, its cultural heritage, the objectives and ideals that we have before us and

what we seek to achieve in future. Unless he knows these he will cut himself away from society and will not be able to render those services to society, which we expect from our engineers. If I may put it this way, an engineer should weave his technology into the fabric of society. You cannot have technology divorced from society. You cannot have application of science to the needs of our people unless you know what their needs are, what our people are aspiring to, towards what end society is directing its energies.

One other point that I have not touched upon — that is the question of shortage of teachers in our technological institutions. We cannot build up institutions like this and we cannot have real advance in technology unless we have a core of first-class teachers and professors. It should be the core of our elite, the best that we have in our country. In my opinion we will be able to satisfy this need and overcome the shortage only if we build up our post-graduate departments. I am very happy to see that to-day for the first time doctorates are awarded to students of this Institute. It is only the post-graduate departments that can be the nursery of the teachers and professors of to-morrow. It is from the post-graduate departments that institutions like this and other technological and scientific institutions in our country can draw men who will opt for the teaching profession. I am conscious of the fact how much these engineers are in demand in Industry. I also know how well Industry can pay these engineers. I also realise that we cannot possibly offer to these teachers and professors competitive salaries. But do not forget that there is no more challenging profession in India to-day than the teacher's profession. It is a tremendous challenge to be able to mould the future of the students ; to be able to help to produce the leaders of to-morrow is a great opportunity and a challenging one. I am sure that many of those who pass out from here will resist the temptation of going into Industry and will take to the teaching profession so that they can render the greatest service to the future generation.

Ladies and Gentlemen, I have finished. This is one of the most imposing Convocations I have ever addressed. I may assure you I have addressed a few in India by now. The setting.

arrangements, the discipline, in every way, it is worthy of a technological institute. If I may say so, your Director, whom I have known for many years — he comes from the same city as I do — Bombay — has applied technology to the convening of this Convocation and to the excellent arrangements for the Convocation.

May I wish the greatest success and happiness and joy in the future to all those who received their degrees this evening!

Thank you.

APPENDIX II

RESULTS OF THIRD INTER-I. I. T. SPORTS MEET—1964

December 28th to December 31st — 1964 at I. I. T. Madras

I. ATHLETICS

Event & Place	*Winner*	*I.I.T.*
100 *m. Sprint* :		
I	C. B. Simpson	Kharagpur
II	P. S. Murthy	Kharagpur
III	A. Banerjee	Kharagpur
IV	George Varghese	Madras
200 *m. Sprint — Record* 23.8 *secs.*:		
I	D. Swarup	Bombay
II	C. B. Simpson	Kharagpur
III	P. Albuquerque	Bombay
IV	A. Banerjee	Kharagpur
400 *m. Sprint — Record* 54.9 *secs.*:		
I	D. Swarup	Bombay
II	G. Srikanth	Madras
III	S. M. Singh	Delhi
IV	John L. Stracy	Madras
800 *m. Run — Record* 2 *m.* 6.5 *secs.* (*New Record*) :		
I	Joshi Paul	Madras
II	D. Swarup	Bombay
III	V. Kumar Srivatsava	Kharagpur
IV	John Stracy	Madras
1,500 *m. Run — Record* 4 *m.* 33.4 *secs.* (*New Record*) :		
I	Joshi Paul	Madras
II	N. R. Dongre	Kharagpur
III	U. Datta	Madras
IV	H. Singh	Bombay

Event & Place	*Winner*	*I.I.T.*
5,000 *m. Run — Record* 18 *m.* 4 *secs.* :		
I	Joshi Paul	Madras
II	Virendra	Kharagpur
III	Juneja	Delhi
IV	H. Singh	Bombay
110 *m. Hurdles — Record* 17.8 *secs.* :		
I	C. M. Ho	Kharagpur
II	Anand Swaminathan	Madras
III	S. Ganguli	Bombay
IV	R. P. Pankhania	Bombay
400 *m. Hurdles — Record* 1 *m.* 3.7 *secs.* :		
I	D. Swarup	Bombay
II	C. B. Simpson	Kharagpur
III	C. M. Ho	Kharagpur
IV	S. Chandra	Kharagpur
Broad Jump — Record 5.85 *m.* :		
I	M. Kalappa	Madras
II	S. Sarkar	Kharagpur
III	N. Bahadur	Bombay
IV	S. A. Aleem	Madras
Hop, Step & Jump :		
I	M. Kalappa	Madras
II	C. B. Simpson	Kharagpur
III	S. A. Aleem	Madras
IV	S. Sarkar	Kharagpur
High Jump — Record 1.78 *m.* :		
I	S. Ganguly	Bombay
II	G. Dandapani	Madras
III	L. Lobo	Bombay
IV	S. S. Prasad	Bombay
Pole Vault — Record 3.10 *m.* (*New Record*) :		
I	R. Samuel	Bombay
II	Joseph Henry	Bombay
III	Ratan Roy	Kharagpur
IV	D. Shenoy	Madras

Event & Place	*Winner*	*I.I.T.*
Shot put — Record 10.48 *m. (New Record)* :		
I	Ashok Singh	Kharagpur
II	R. N. Rai	Kanpur
III	C. M. Ho	Kharagpur
IV	R. P. Pankhania	Bombay
Discus Throw — Record 31.11 *m.* :		
I	C. M. Ho	Kharagpur
II	R. P. Pankhania	Bombay
III	S. Hemmady	Bombay
IV	Ashok Singh	Kharagpur
Javelin Throw — Record 57.2 *m. (New Record)* :		
I	A. S. Oberoi	Delhi
II	Ratan Roy	Kharagpur
III	P. K. Philip	Kharagpur
IV	R. Bhatia	Bombay
Hammer Throw — Record 27.23 *m. (New Record)* :		
I	R. P. Pankhania	Bombay
II	Joginder Singh	Kharagpur
III	R. Puri	Madras
IV	C. M. Ho	Kharagpur
4 × 100 *m. Relay — Record* 47.5 *secs.* :		
I	Bombay	
II	Kharagpur	
III	Madras	
4 × 400 *m. Relay* :		
I	Madras	
II	Kharagpur	
III	Bombay	

Individual Championship won by SHRI D. SWARUP *of I. I. T. Bombay by securing* 18 *points.*

Team Championship won by I. I. T. Kharagpur by securing 76 *points.*

II. GYMNASTICS

Event & Place	*Winner*	*I.I.T.*
Parallel Bar :		
I	V. V. Singh	Kharagpur
II	E. A. Olia	Madras
III	Prabhakar Dutt	Kharagpur
Horizontal Bar :		
I	V. V. Singh	Kharagpur
II	A. G. Kulkarni	Bombay
III	D. V. Karandikar	Bombay
Freehand & Ground Exercises :		
I	V. V. Singh	Kharagpur
II	A. G. Kulkarni	Bombay
III	E. A. Olia	Madras
Mr. Strongman :		
I	V. K. Misra	Kharagpur
II	Anantharama Iyer	Madras
III	S. K. Gupta	Bombay
Mr. I. I. T. :		
I	A. Sen	Kharagpur
II	S. K. Mitra	Kharagpur
III	Nam Joshi	Bombay

Team Championship won by I. I. T. Kharagpur by securing 16.*points.*

II Bombay

III Madras.

III. Games

Event & Place	*Winner*	*Record*
Football :		
I	Madras	10 points
II	Bombay	6 ,,
III	Kharagpur	2 ,,
Hockey :		
I	Kharagpur	10 ,,
II	Madras	6 ,,
III	Bombay	2 ,,
Volley Ball :		
I	Madras	10 ,,
II	Kharagpur	6 ,,
III	Bombay	2 ,,
Basket Ball :		
I	Bombay	10 ,,
II	Kharagpur	6 ,,
III	Madras	2 ,,
Tennis :		
I	Kharagpur	10 ,,
II	Bombay	6 ,,
III	Madras	2 ,,
Table Tennis :		
I	Kharagpur	10 ,,
II	Bombay	6 ,,
III	Madras	2 ,,
Badminton (Shuttle) :		
I	Bombay	10 ,,
II	Kharagpur	6 ,,
III	Delhi	2 ,,

General Championship won by I. I. T. Kharagpur by securing 75 points.

STATEMENT No. 1.

JOINT ENTRANCE EXAMINATION — 1964

Statement of applications received for admission to the I & II Years (pertaining to centres located in Southern Zone) giving State-wise distribution and first choice of Institute

S. No.	State	First Choice of Institute					Total	First Choice of Institute			Total
		Bombay	Delhi	Kanpur	Kharagpur	Madras		Bombay	Delhi	Kharagpur	
1.	Andhra Pradesh ..	70	15	2	215	460	762	40	10	76	126
2.	Assam ..	..	..	..	..	..	..	..	..	..	..
3.	Bihar ..	..	..	..	..	..	..	..	1	..	1
4.	Delhi ..	..	1	..	1	1	3	..	..	..	..
5.	Goa ..	..	..	..	..	..	..	..	..	..	..
6.	Gujarat ..	3	..	..	3	1	7	1	..	..	1
7.	Himachal Pradesh ..	..	..	..	..	..	..	..	..	..	..
8.	Jammu & Kashmir ..	..	..	..	..	..	..	..	..	..	..
9.	Kerala ..	28	11	3	41	248	331	15	2	15	32
10.	Madhya Pradesh ..	..	..	..	1	..	1	..	..	..	..
11.	Madras ..	22	14	..	44	1,358	1,438	27	6	32	65
12.	Maharashtra ..	5	..	..	..	2	7	2	..	..	2
13.	Manipur ..	..	..	..	..	..	..	..	..	..	..
14.	Mysore ..	131	5	2	47	250	435	78	5	22	105
15.	Nagaland ..	..	..	..	..	..	..	..	..	..	..
16.	Orissa ..	..	..	..	..	..	..	..	..	1	1
17.	Pondicherry ..	..	..	..	1	14	15	..	..	..	..
18.	Punjab ..	1	2	..	3	3	9	..	1	..	1
19.	Rajasthan ..	1	..	..	1	7	9	..	..	..	..
20.	Tripura ..	..	..	..	..	..	..	..	..	..	..
21.	Uttar Pradesh ..	..	1	..	2	2	5	..	1	1	2
22.	West Bengal ..	..	..	..	4	1	5	..	..	..	..
23.	Displaced persons ..	2	..	..	1	1	4	..	..	1	1
24.	Foreign Countries ..	..	..	..	..	..	..	..	..	..	..
	Total ..	262	49	7	364	2,348	3,030	163	26	148	337

STATEMENT No. 2.

Statement showing the number of candidates registered for the examination (State-wise) at the various centres in the Southern Zone

S. No.	Centre	State — First Year						State — Second Year				
		Andhra	Kerala	Madras	Mysore	Pondicherry	Others	Andhra	Kerala	Madras	Mysore	Others
1.	Anantapur ..	35	..	1	1	..	..	2	..	..	..	..
2.	Hyderabad ..	238	..	1	3	..	2	37	..	..	..	1
3.	Kakinada ..	153	..	..	1	..	..	19	..	..	..	..
4.	Secunderabad ..	56	2	5	3	..	4	15	..	..	..	1
5.	Waltair ..	115	..	1	3	..	2	14	..	..	..	..
6.	Warangal ..	39	..	..	..	..	..	2	..	..	..	..
7.	Calicut ..	..	38	1	1	..	..	..	..	..	..	..
8.	Trichur ..	..	120	..	1	1	1	..	4	..	..	..
9.	Trivandrum ..	..	106	22	..	..	2	..	4	..	..	1
10.	Coimbatore ..	1	7	127	2	..	1	..	..	1	..	..
11.	A. M. Jain College, Madras	5	10	238	2	2	12	..	..	5	..	..
12.	Pachaiyappa's College, „	61	14	239	7	2	3	3	1	4	1	2
13.	Vivekananda College, „	36	11	266	7	8	6	2	..	4	..	2
14.	Madurai ..	..	..	190	..	..	..	..	..	3	..	..
15.	Salem ..	..	..	62	..	..	..	..	..	1	..	..
16.	Tiruchirappalli ..	..	2	226	..	2	1	..	..	1	1	..
17.	Bangalore ..	8	11	23	222	..	8	..	..	1	27	..
18.	Dharwar ..	1	..	..	86	..	3	..	..	..	4	..
19.	Mangalore ..	..	7	..	80	..	..	..	..	..	5	1
	Total ..	748	328	1,402	419	15	45	94	9	20	38	8

TOTAL : I YEAR — 2,957 ; II YEAR — 169.

STATEMENT No. 3.

Statement showing the number of candidates who actually took the examination at the various centres in the Southern Zone

S. No.	Centre	First Year						Second Year			
		Maths.	English	Physics (A)	Chemistry (A)	Phy. & Chem. (B)	Drg. (B)	Maths.	English & Genl. knowledge	Physics	Chemistry
1.	Anantapur ..	30	29	25	23	3	3	2	2	1	1
2.	Hyderabad ..	200	191	177	175	12	12	21	21	20	19
3.	Kakinada ..	130	127	118	116	7	7	15	15	15	15
4.	Secunderabad ..	65	64	59	58	4	4	14	14	14	14
5.	Waltair ..	99	97	87	87	8	8	10	10	10	10
6.	Warangal ..	28	28	25	25	3	3	2	2	2	2
7.	Calicut ..	32	31	30	30	1	1	..	..	..	..
8.	Trichur ..	103	101	93	93	7	7	2	2	2	2
9.	Trivandrum ..	109	108	96	92	10	10	3	3	3	3
10.	Coimbatore ..	125	122	112	111	8	7	1	1	1	1
11.	A. M. Jain College, Madras	254	253	232	229	18	18	4	4	4	4
12.	Pachaiyappa's College, „	294	293	272	271	21	21	7	7	7	7
13.	Vivekananda College, „	317	314	274	271	38	36	6	6	6	5
14.	Madurai ..	170	168	156	154	11	11	2	2	2	2
15.	Salem ..	60	59	54	54	4	4	1	1	1	1
16.	Trichinopoly ..	210	209	201	198	6	6	2	2	2	2
17.	Bangalore ..	247	242	234	228	5	5	19	19	18	17
18.	Dharwar ..	73	72	66	65	6	6	3	3	3	3
19.	Mangalore ..	76	76	71	71	5	5	5	5	5	5
	Total ..	2,622	2,584	2,382	2,351	177	174	119	119	116	113

STATEMENT NO. 4.

Statement showing the number of Scheduled Caste candidates registered for the examination (State-wise) at the various centres in the Southern Zone

S. No.	Centre	State — First Year					State — Second Year	
		Andhra	Kerala	Madras	Mysore	Pondicherry	Andhra	Other States
1.	Anantapur ..	1	..	..	..	..	..	..
2.	Hyderabad ..	3	..	..	..	..	1	..
3.	Kakinada ..	1	..	..	..	..	..	..
4.	Secunderabad ..	1	..	..	..	..	..	..
5.	Waltair ..	1	..	..	..	..	..	..
6.	Warangal ..	..	..	..	..	..	..	..
7.	Calicut ..	..	1	..	..	..	..	..
8.	Trichur ..	..	..	..	..	..	..	..
9.	Trivandrum ..	..	..	..	..	..	..	..
10.	Coimbatore ..	..	..	1	..	..	..	..
11.	A. M. Jain College, Madras	..	..	1	..	..	..	..
12.	Pachaiyappa's College, Madras	..	..	3	..	..	..	..
13.	Vivekananda College, Madras	..	..	2	..	2	..	..
14.	Madurai ..	..	..	1	..	..	..	..
15.	Salem ..	..	..	1	..	..	..	..
16.	Trichy ..	..	..	2	..	..	..	..
17.	Bangalore ..	..	..	..	3	..	..	..
18.	Dharwar ..	..	..	..	1	..	..	..
19.	Mangalore ..	..	..	..	..	..	..	..
	Total ..	7	1	11	4	2	1	..

TOTAL : I YEAR — 25; II YEAR — 1.

Number of candidates who qualified in the written examination and were called for interview at I.I.T., Madras for admission to the 5-year B.Tech. Course (Distribution shown State-wise)

S No.	State	First choice of Institute (I-Year)					Total	First choice of Inst. (II-Year)			
		Bombay	Delhi	Kanpur	Kharagpur	Madras		Bombay	Delhi	Kharagpur	Total
1.	Andhra Pradesh ..	1	2	..	8	10	21	..	..	2	2
2.	Assam ..	..	..	..	..	..	..	..	..	..	..
3.	Bihar ..	..	..	..	..	..	..	..	..	..	..
4.	Delhi ..	..	1	..	1	..	2	..	..	..	..
5.	Goa ..	..	..	..	..	..	..	..	..	..	..
6.	Gujarat ..	..	..	..	2	..	2	..	..	..	..
7.	Himachal Pradesh ..	..	..	..	..	..	..	..	..	..	..
8.	Jammu & Kashmir ..	..	..	..	..	..	..	..	..	..	..
9.	Kerala ..	..	1	..	3	14	18	..	..	..	..
10.	Madhya Pradesh ..	..	..	..	..	..	..	..	..	..	..
11.	Madras ..	4	3	..	9	140	156	..	..	1	1
12.	Maharashtra ..	2	..	..	..	..	2	..	..	..	..
13.	Manipur ..	..	..	..	..	..	..	..	..	..	..
14.	Mysore ..	15	..	..	9	36	60	1	..	..	1
15.	Nagaland ..	..	..	..	..	..	..	..	..	..	..
16.	Orissa ..	..	..	..	..	..	..	..	..	..	..
17.	Pondicherry ..	..	..	..	..	..	..	..	..	..	..
18.	Punjab ..	..	..	..	..	..	..	..	..	..	..
19.	Rajasthan ..	..	1	..	1	..	2	..	..	..	..
20.	Tripura ..	..	..	..	..	..	..	..	..	..	..
21.	Uttar Pradesh ..	..	..	..	..	..	..	..	..	1	1
22.	West Bengal ..	..	..	..	1	..	1	..	..	..	..
23.	Displaced persons ..	1	..	..	..	2	3	..	..	..	..
24.	Foreign Countries ..	..	..	..	..	..	..	..	..	..	..
	Total ..	23	8	..	34	202	267	1	..	4	5

(No Scheduled Caste/Tribe candidates qualified in the written examination.)

STATEMENT No. 6.

Total number of students offered admission to the I Year of the 5-year Integrated Course at I.I.T., Madras for the session 1964-65 after interview at the five I.I.Ts. (Distribution shown State-wise)

S. No.	State	Interviewed at I. I. T.					Total
		Bombay	Delhi	Khanpur	Kharagpur	Madras	
1.	Andhra Pradesh	..	1	..	..	11	12
2.	Assam	..	..	..	..	..	..
3.	Bihar	..	..	..	2	..	2
4.	Delhi	..	12	1	..	..	13
5.	Goa	..	..	..	..	..	..
6.	Gujarat	..	..	..	1	..	1
7.	Himachal Pradesh	..	..	..	..	..	..
8.	Jammu & Kashmir	..	..	..	..	..	..
9.	Kerala	..	4	..	1	10	15
10.	Madhya Pradesh	..	..	..	..	..	..
11.	Madras	1	8	1	2	122	134
12.	Maharashtra	2	..	..	1	..	3
13.	Manipur	..	..	..	..	..	..
14.	Mysore	..	1	..	1	33	35
15.	Nagaland	..	..	..	..	..	..
16.	Orissa	..	..	..	2	..	2
17.	Pondicherry	..	..	..	..	..	..
18.	Punjab	..	..	1	..	..	1
19.	Rajasthan	..	..	..	..	..	..
20.	Tripura	..	..	..	..	..	..
21.	Uttar Pradesh	..	2	23	..	..	25
22.	West Bengal	..	..	..	15	..	15
23.	Displaced persons	..	..	..	..	1	1
24.	Foreign Countries	..	..	..	..	..	..
	Total	.. 3	28	26	25	177	259

(No Scheduled Caste/Tribe candidates qualified for admission.)

STATEMENT No. 7.

Total number of students who actually joined the I Year of the 5-year Integrated Course at I.I.T., Madras for the session 1964-65 after the interviews at the five I.I.Ts. (Distribution shown State-wise & Course-wise)

S. No.	State	COURSE					Total
		Mechanical Engg.	Electrical Engg.	Chemical Engg.	Metallurgical Engg.	Civil Engg.	
1.	Andhra Pradesh ..	2	2	1	1	4	10
2.	Assam ..	..	..	..	..	..	..
3.	Bihar ..	..	1	..	..	..	1
4.	Delhi ..	2	4	2	1	..	9
5.	Goa ..	..	..	..	..	..	..
6.	Gujarat ..	1	..	..	..	..	1
7.	Himachal Pradesh ..	..	..	..	..	..	..
8.	Jammu & Kashmir ..	..	..	..	..	..	..
9.	Kerala ..	6	..	4	2	1	13
10.	Madhya Pradesh ..	..	..	..	..	..	..
11.	Madras ..	30	22	17	19	21	109
12.	Maharashtra ..	2	..	..	..	1	3
13.	Manipur ..	..	..	..	..	..	..
14.	Mysore ..	9	10	3	2	5	29
15.	Nagaland ..	..	..	..	..	..	..
16.	Orissa ..	..	..	1	1	..	2
17.	Pondicherry ..	..	..	..	..	..	..
18.	Punjab ..	..	..	..	1	..	1
19.	Rajasthan ..	..	..	..	..	..	..
20.	Tripura ..	..	..	..	..	..	..
21.	Uttar Pradesh ..	6	2	2	3	3	16
22.	West Bengal ..	2	4	..	..	4	10
23.	Displaced persons ..	..	..	..	..	1	1
24.	Foreign Countries ..	..	..	..	..	..	..
	Total ..	60	45	30	30	40	205

(No Scheduled Caste/Tribe candidates qualified for admission.)

STATEMENT No. 8.

Consolidated statement relating to candidates from the Southern Zone for admission to the I Year of the 5-year Integrated Course (Session 1964-65)

S. No	State	No of applications		No. qualified for interview at	No. offered admission to	No. actually joined	Branch				
		Received	Registered for Exam.	I. I. T. Madras			Mech.	Elec.	Met.	Chemical	Civil
1.	Andhra Pradesh ..	762	748	21	12	10	2	2	1	1	4
2.	Assam ..	..	..	..	..	..	..	..	..	..	..
3.	Bihar ..	..	..	..	2	1	2	4	1	2	..
4.	Delhi ..	3	3	2	13	9	2	4	1	2	..
5.	Goa ..	..	..	..	..	..	..	..	..	..	..
6.	Gujarat ..	7	6	2	1	1	1	..	..	..	..
7.	Himachal Pradesh ..	..	..	..	..	..	..	..	..	..	..
8.	Jammu & Kashmir ..	..	..	..	..	..	..	..	..	..	..
9.	Kerala ..	331	328	18	15	13	6	..	2	4	1
10.	Madhya Pradesh ..	1	1	..	..	..	..	..	..	..	..
11.	Madras ..	1,438	1,402	156	134	109	30	22	19	17	21
12.	Maharashtra ..	7	6	2	3	3	2	..	..	..	1
13.	Manipur ..	..	..	..	..	..	..	..	..	..	..
14.	Mysore ..	435	419	60	35	29	9	10	2	3	5
15.	Nagaland ..	..	..	..	..	..	..	..	..	..	..
16.	Orissa ..	..	..	..	2	2	..	..	2	2	..
17.	Pondicherry ..	15	15	..	..	..	..	..	..	..	..
18.	Punjab ..	9	8	..	1	1	..	..	1	..	..
19.	Rajasthan ..	9	8	2	..	..	..	..	..	..	..
20.	Tripura ..	..	..	..	..	..	..	..	..	..	..
21.	Uttar Pradesh ..	5	5	..	25	16	6	2	3	2	3
22.	West Bengal ..	5	4	1	15	10	2	4	..	..	4
23.	Displaced persons ..	4	4	3	1	1	..	..	..	..	1
24.	Foreign Countries ..	..	..	..	..	..	..	..	..	..	..
	Total ..	3,030	2,957	267	259	205	60	45	30	30	40

APPENDIX IV

STRENGTH OF STUDENTS ON THE ROLLS

5-year B.Tech Degree Course

CLASS	1963-64	1964-65
I year	233	214
II year	187	230
III year—		
Civil Engineering . .	21	33+2 *
Mechanical Engineering . .	43	60
Electrical Engineering . .	38	40+1 *
Chemical Engineering . .	20	41
Metallurgy	23	20+1 *
	145	198
IV year—		
Civil Engineering . .	16	18
Mechanical Engineering . .	35	40
Electrical Engineering (HC)	23	23
Electrical Engineering (LC)	9	13
Chemical Engineering . .	20	18
Metallurgy	19	23
	122	135
V year—		
Civil Engineering . .	16	16
Mechanical Engineering . .	28	35
Electrical Engineering (HC)	16	23
Electrical Engineering (LC)	8	9
Chemical Engineering . .	11	20
Metallurgy	13	19
	92	122

* External student.

3 *year B.Tech. Degree Course*

Class	1963-64		1964-65	
	I Term	*II Term*	*I Term*	*II Term*
I year	90	82	77	74
II year	..	..	108	108
M.Sc. Degree Course				
Physics Branch :				
I year	11	10	8	9
II year	9	9	8	7
Chemistry Branch :				
I year	4	4	6	6
II year	..	..	3	3
Mathematics Branch :				
I year	..	..	8	6
II year	5	5	..	..
M.Tech. Degree Course				
Chemical Engineering :				
I year	7	6	8	6
II year	..	..	6	6
Civil Engineering :				
I year	10	10	10	9
II year	..	..	10	10
Electrical Engineering :				
I year	12	12	10	8
II year	..	..	12	12
Mechanical Engineering :				
I year	4	4	4	4
II year	..	..	4	4

APPENDIX V

RESULTS OF EXAMINATIONS AT THE END OF 1964-65 ACADEMIC SESSION

Statement showing the results of the I, II, III, IV and V year classes of the 5 year B.Tech Degree Course.

Class	Branch	No. of Students on rolls	No. permitted to take final Examination	Total Passed	Total Failed	Percentage
I year	All	214	201	196	5	98
II year	All	230	223	208	15	93
III year						
	Civil Engineering	33+2*	31+2*	31+2*	..	
	Mechanical Engineering	60	60	56	4	
	Electrical Engineering	40+1*	38+1*	35+1*	3	
	Chemical Engineering	41	40	37	3	
	Metallurgy	20+1*	18+1*	18+1*	..	
		194+4*	187+4*	177+4*	10	95
IV year						
	Civil Engineering	18	18+1*	18+1*	..	
	Mechanical Engineering	40	40	37	3	
	Electrical Engineering (H.C)	23	22+2*	22+1*	1*	
	Electrical Engineering (L.C.)	13	13	12	1	
	Chemical Engineering	18	18+1*	17+1*	1	
	Metallurgy	23	23+1*	23+1*	..	
		135	134+5*	129+4*	5+1*	96

V year

Civil Engineering	16	16	16@	..	
Mechanical Engineering	35	35	35	..	
Electrical Engineering (H.C.)	23	23	22@	1	
Electrical Engineering (L.C.)	9	9	9	..	
Chemical Engineering	20	20	18@	2	
Metallurgy	19	19	18@	1	
	122	122	118	4	97
			114		

* External student.

@ One student yet to successfully complete the fourth year of the course.

Course	No. appeared		No. Passed		No Failed		Percentage of pass	
	I Term	II Term	I Term	II Term	I Term	II Term	I Term	II Term
3-YEAR B.TECH. DEGREE COURSE								
I year	108	108	102	93	5@	15*	94.5%	86.1%
II year	77	74	74	73	3	1	96.1%	98.6%
M.SC. DEGREE COURSE								
Physics Branch :								
I year	8	8	2	2	6	6	25%	25%
II year	8	7	5	6	3	1	63%	86%
Chemistry Branch :								
I year	6	6	1	3	5	3	17%	50%
II year	3	3	3	3	..	..	100%	100%
Mathematics Branch :								
I year	6	6	6	5	..	1	100%	83%
M.TECH. DEGREE COURSE								
Civil Engineering :								
I year	9	9	5	6	4	3	56%	67%
II year	10	10	10	10	..	..	100%	100%
Electrical Engineering :								
I year	8	8	4	6	4	2	50%	75%
II year	12	12	12	12	..	..	100%	100%
Chemical Engineering :								
I year	7	6	7	5	..	1	100%	83%
II year	6	6	5	6	1	..	83%	100%
Mechanical Engineering :								
I year	4	4	3	3	1	1	75%	75%
II year	4	4	4	4	..	..	100%	100%

* 3 students failed and 12 students detained on account of shortage of attendance.

@ One student discontinued.

APPENDIX VI

SCHOLARSHIPS AND LOANS

Number awarded

I. INSTITUTE SCHOLARSHIPS

(*a*) *Undergraduate Course* :

(i) 5 *year B.Tech. Degree Course*—

Merit Scholarship	..	63
Merit-cum-Means Scholarship		144
Free Studentship	..	37

(ii) 3 *year B.Tech Degree Course*—

Merit Scholarship	..	11
Merit-cum-Means Scholarship		36
Free Studentship	..	17

(*b*) *Post-Graduate Degree Courses* :

(i) *M.Sc. Degree Course*—

Merit Scholarship	..	4
Merit-cum-Means Scholarship		6
Free Studentship	..	5

(ii) *M.Tech. Degree Course*—

Chemical Engineering	..	14
Civil Engineering	..	18
Electrical Engineering	..	21
Mechanical Engineering	..	7

(c) *Ph.D. Degree Course* .. 19

II. EXTERNAL SCHOLARSHIPS AND LOANS

Sl. No	Name of the Sanctioning Authority	Nature of Scholarships	No. of students awarded	Value per annum per Student Rs.
1.	Ministry of Education, Government of India, New Delhi	Post-Matric Merit Scholarship ..	2	1,200
2.	Director of Public Instruction, Andhra Pradesh, Hyderabad	National Scholarships ..	8	1,320
3.	-do-	Educational concession to children of political sufferers ..	1	400
4.	-do-	Merit Scholarship for children of secondary and primary school teachers ..	1	1,100
5.	Director of Social Welfare, Hyderabad	Govt. of India Scholarship (Decentralized)	3	900
6.	Director of Technical Education, Assam, Shillong	Engineering Scholarship ..	1	900
7.	-do-	-do- ..	1	640
8.	State Scholarship Board for Backward and other Backward Classes	Govt. of India Scholarship (Decentralized)	2	1,112
9.	-do-	-do- ..	1	1,187
10.	Director of Education, Gujarat, Ahmedabad	National Scholarship ..	1	660
11.	Director of Education, Himachal Pradesh Administration, Simla	Engineering Scholarship ..	1	990
12.	The Director of Education, Himachal Pradesh Administration, Simla	Govt. of India Scholarship (Decentralized)	1	1,127

II. EXTERNAL SCHOLARSHIPS AND LOANS—(*Contd.*)

Sl. No.	Name of the Sanctioning Authority	Nature of Scholarships	No. of students awarded	Value per annum per Student Rs.
13.	Director of Collegiate Education, Trivandrum	National Scholarship ..	1	1,320
14.	Director of Technical Education, Madhya Pradesh, Bhopal	Engineering Scholarship ..	1	1,000
15.	Director of Harijan Welfare, Madras	Govt. of India Post-Matric Scholarships (Decentralized) ..	2	900
16.	-do-	Madras State Scholarship for Backward Classes ..	2	790
17.	Director of Higher Education, Madras	National Post-Matric Merit Scholarships ..	33	1,320
18.	-do-	National Merit Scholarship for children of secondary and primary school teachers ..	1	1,000
19.	Director of Education, Maharashtra State, Poona	National Merit Scholarships ..	2	1,000
20.	Director of Social Welfare, Maharashtra, Poona	Govt. of India Scholarship (Decentralized)	1	1,127
21.	Director of Collegiate Education, Mysore, Bangalore	National Merit Scholarships ..	10	990
22.	Director of Rural and Tribal Welfare, Orissa, Bhubaneswar	Govt. of India Scholarship (Decentralized)	1	880

II. EXTERNAL SCHOLARSHIPS AND LOANS—(*Contd.*)

Sl. No.	Name of the Sanctioning Authority	Nature of Scholarships	No. of students awarded	Value per annum per Student Rs.
23.	Education Department, Government of Orissa, Bhubaneswar	Loan Stipend ..	10	1,375
24.	Director of Public Instruction, The Punjab Government, Chandigarh	Govt. of India Scholarship (Decentralized)	1	1,127
25.	Director of Technical Education, Chandigarh	Loan Stipend for Engineering studies ..	4	450
26.	Director of Public Instruction, West Bengal, Calcutta	National Scholarships ..	2	1,320
27.	Director of Tribal Welfare, West Bengal, Calcutta	Govt. of India Scholarship (Decentralized)	2	887 1,110
28.	Director of Harijan Welfare, Uttar Pradesh, Lucknow	-do- ..	1	900
29.	Messrs. Tata Iron & Steel Co. Ltd., Jamshedpur	Jubilee Scholarships ..	4	1,500
30.	Department of Atomic Energy, A.E.E.T., Bombay	Undergraduate Scholarships for Metallurgical Engineering ..	2	1,800
31.	Prime Minister's Relief Fund, New Delhi	Financial Aid ..	1	900
32.	Lala Santaram Tirakram Public Charitable Trust, Amritsar	Educational Stipend ..	1	525

APPENDIX VI-A

STUDENTS' AID FUND

The Students' Aid Fund Committee constituted for the year 1963-64 was continued during the year 1964-65 also.

1.	Director	.. *Chairman*
2.	Registrar	.. *Member (Ex-officio)*
3.	Prof. P. C. Varghese	.. *Secretary*
4.	Dr. M. Venugopal (Assistant Professor, Electrical Engineering Department)	.. *Member*
5.	Dr. M. S. Vairanapillai (Assistant Professor, Humanities Department)	.. *Treasurer*
6.	Dr. B. V. A. Rao (Assistant Professor, Department of Applied Mechanics).	.. *Member*
7.	Secretary, Institute Gymkhana.	.. *Student Representative*

The year commenced with an opening balance of Rs. 5,281.17 as against the opening balance of Rs. 3,261.17 for the year 1963-64. During the course of the year a sum of Rs. 13,271.00 was received as contribution from the students of this Institute through their hostels. A sum of Rs. 40.00 was paid by one student towards the loan paid to him.

Financial assistance was rendered to the following nine student to the extent of Rs. 3,200.

		Rs.
1.	Shri Krishnamurthy Meduri ..	400
2.	Shri Prem Indersingh ..	400
3.	Shri Sitarama Rao ..	400
4.	Shri M. Sundararaju ..	400
5.	Shri Sunhil Kumar Dhall ..	400
6.	Shri Atmakuri Gandhi ..	300
7.	Shri Prem Kumar Verma ..	300
8.	Shri M. Narayana Rao ..	300
9.	Shri D. Sundararajan ..	300

At the close of the year, the balance to the credit of the fund was Rs. 14,942.17.

APPENDIX VII

PRIZES FOR ACADEMIC DISTINCTION AT THE END OF 1964-65 ACADEMIC SESSION

(a) *Prizes awarded at the First Convocation* :

PRESIDENT'S PRIZE : For the best student of the 5 year B.Tech. Degree Course.

Shri S. R. Thangavelu—Mechanical Engineering.

GOVERNOR'S PRIZE : For all round proficiency in 5 year B.Tech. Degree Course (curricular and extra curricular).

Shri S. Gopalakrishnan—Mechanical Engineering.

INSTITUTE MERIT PRIZES : For the best student in each Discipline.

A. *M.Sc. Degree Course* :

Shri B. Nagabhushanam—Mathematics.
Shri T. M. Haridasan—Physics.

B. *5 year B.Tech. Degree Course* :

Shri P. S. Krishnamurthi—Chemical Engineering.
Shri B. S. Sudhirchandra—Civil Engineering.
Shri G. N. Sharma—Electrical Engineering.
Shri S. R. Thangavelu—Mechanical Engineering.
Shri R. Natarajan—Metallurgy.

(b) *Prizes awarded at the Second Convocation* :

PRESIDENT'S PRIZE : For the best student of the 5 year B.Tech. Degree Course.

Shri C. R. Muthukrishnan—Electrical Engineering.

GOVERNOR'S PRIZE : For all round proficiency in 5 year B.Tech. Degree Course (curricular and extra curricular).

Shri Basu John Vetteth—Mechanical Engineering.

INSTITUTE MERIT PRIZES : For the best student in each Discipline.

5 year B.Tech. Degree Course :

Shri R. V. S. Mani—Chemical Engineering.
Shri K. M. Kripa Narayanan—Civil Engineering.
Shri C. R. Muthukrishnan—Electrical Engineering (H.C.)
Shri Ramesh A. Vaswani—Mechanical Engineering.
Shri M. Narayanan Kutty Menon—Metallurgy.

SIEMENS PRIZE : For the best student in Electrical Engineering.

Shri Kanianthra Mani Chandy—Electrical Engineering (L.C.)

(c) INSTITUTE MERIT PRIZES : (For each class).

Branch	*Name of student and year*	*Prize awarded*	*Value of prize* Rs.
5 *year B.Tech Degree Course*			
First year—			
	Shri Vikram Prabhu	I	50
	Shri Jayant Baliga	II	25
Second year—			
	Shri Dilip Bhandarkar	I	50
	Shri V. Muralidhar	II	25
Third year—			
Civil Engineering :			
	Shri P. S. Govindarajan	I	50
Mechanical Engineering :			
	Shri Gursharan Singh Sidhu	I	50
Electrical Engineering :			
	Shri R, Kalyanakrishnan	I	50

Branch	*Name of student and year*	*Prize awarded*	*Value of prize* Rs.
Chemical Engineering :			
	Shri S. K. Subramanian	I	50
Metallurgy :			
	Shri Gajanan Rajaram Kamath	I	50
Fourth year—			
Civil Engineering :			
	Shri K. V. Natarajan	I	50
Mechanical Engineering :			
	Shri V. Srinivasan	I	50
Electrical Engineering :			
	Shri Radhakrishna Rao	I	50
Chemical Engineering :			
	Shri N. Sekhar	I	50
Metallurgy :			
	Shri K. Jagannadhan	I	50
3 *year B.Tech Degree Course* :			
First year—			
	Shri Naresh Puri	I	50
Second year—			
Civil Engineering :			
	Shri B. V. Satyanarayana	I	50
Mechanical Engineering :			
	Shri A. S. Rangan	I	50
Electrical Engineering :			
	Shri P. Niranjana Reddy	I	50

Branch	*Name of student and year*	*Prize awarded*	*Value of prize* Rs.
Chemical Engineering :			
	Shri L. Padmanabhan	I	50
Metallurgy :			
	Shri R. Ramachandran	I	50

M.Sc. Degree Course :

First year—

Mathematics :			
	Shri V. Sundaresan	I	50
Physics :			
	Shri B. Sudhir Nanda	I	50
Chemistry :			
	Shri S. Santhana Gopalan	I	50

M.Tech. Degree Course :

First year—

Civil Engineering :			
	Shri B. S. Sudhirchandra	I	50
Mechanical Engineering :			
	Shri N. Santhanam	I	50
Electrical Engineering :			
	Shri K. Raman Nair	I	50
Chemical Engineering :			
	Shri C. P. Vijayan	I	50

APPENDIX VIII

Staff Appointments, Resignations, etc.

(List of persons joined during 1964-65)

Registrar :

Shri C. V. Sethunathan.

Assistant Professors :

1. Dr. L. V. K. V. Sarma.
2. Dr. B. V. Ramanamurthy.
3. Dr. V. Srinivasan.
4. Dr. V. Sivaramakrishnan.
5. Dr. V. C. Venkatesh.
6. Dr. M. Satyanarayana.
7. Dr. R. Vasudevan.
8. Dr. K. Srinivasaraghavan.

Lecturers :

1. Shri V. Ramabhadran.
2. Shri K. A. Bhaskaran.
3. Shri S. Bhimasankara Sastry.
4. Shri C. Ganapathi Chettiar.
5. Shri K. Sankara Rao.
6. Shri S. Sundaresan.
7. Shri V. Radhakrishnan.
8. Shri V. S. N. Sarma.
9. Shri K. R. Govinda Mallan.
10. Shri P. K. Ninan.
11. Shri S. Ramakrishna Iyer.
12. Shri V. Seshadri.
13. Shri K. Satyanarayana.
14. Dr. K. K. Mukhopadhayaya.
15. Dr. V. Ramakrishnan.
16. Dr. N. M. Raghavendra.

17. Shri T. Rajagopalan.
18. Shri V. Nagarajan.
19. Dr. H. S. Paul.
20. Dr. R. Subramanian.
21. Shri A. Ramamohana Rao.
22. Shri A. Chandrasekaran.
23. Shri V. V. Bapeswara Rao.
24. Dr. G. S. Davies.
25. Dr. A. V. Krishna Rao.
26. Shri V. Sriramulu.

Associate Lecturers :

1. Shri V. Subba Rao.
2. Shri G. Sama Rao.
3. Shri K. V. Nagarajan.
4. Shri V. Paramasivam.
5. Shri B. Vasudeva Rao.
6. Shri M. V. Jagannadha Rao.
7. Shri N. M. Anil Kumar.
8. Shri D. V. Ramalingeswara Rao.
9. Shri V. Rajagopalan.
10. Shri S. Ramaswamy.
11. Shri K. Jayasimhulu.
12. Shri A. Baradarajan.
13. Shri R. Subramanian.
14. Shri P. Krishna Iyer.
15. Shri M. Ramakrishna Udupa.
16. Shri S. Gopalakrishnan.
17. Shri A. S. Venkateshamurthy.
18. Shri K. Viswanatha Reddy.
19. Shri K. J. Lakshminarayana Iyer.
20. Shri A. B. Srinivasan.
21. Shri T. K. Ramakrishnan.
22. Shri T. S. Sathiamurthi.
23. Shri S. Sukumar.
24. Shri M. N. Viswanathan.
25. Shri P. Suryanarayana Chetty.

Senior Technical Assistants :

1. Shri A. T. Santhanam.
2. Shri A. B. Srinivasan.
3. Shri S. Dhasarathy.
4. Shri P. R. Kannan.
5. Shri R. Ramakrishnan.
6. Shri K. N. Ramamurthy.
7. Shri K. A. Natarajan.
8. Shri G. Sreenivasamurthy.
9. Shri T. K. Ramanujam.
10. Shri C. S. Krishnan.
11. Shri V. Ramachandran.
12. Shri K. S. Ponnuswamy.
13. Shri K. J. Sethuraman.
14. Shri C. V. Sahasranamam.
15. Shri Basu John Vetteth.
16. Shri V. Ranganathan.
17. Shri S. Abdul Khader.
18. Shri B. Ramachandra Pai.
19. Shri A. Vijayakumar.
20. Shri C. T. Zachariah.
21. Shri Man Mohan Gupta.
22. Shri V. Sekar.
23. Shri Y. N. V. Ramakrishna Rao.
24. Shri V. Siddhartha.
25. Shri S. Kumaran.
26. Shri K. R. Subramanian.
27. Shri L. Varadan.
28. Shri J. Chandramouli.
29. Shri R. Ramamoorthy.

Junior Technical Assistants :

1. Shri K. Vasudevan.
2. Shri K. P. Gopalarathnam.
3. Shri S. Shanmugham.
4. Shri V. Raman.
5. Shri K. Sankaran.
6. Shri P. Venkatesan.
7. Shri C. Deenadayalan.

Assistant Librarian :

Shri V. K. Vedapuri.

Assistant :

Shri C. Narayanan Kutty.

Divisional Accountant :

Shri P. S. Krishnamurthy.

Assistant Accountant :

Kum. G. Saroja.

Upper Division Clerks :

1. Shri K. Natarajan.
2. Shri D. Sankaralingam.
3. Shri S. Venkataramani.
4. Shri R. Gopalakrishnan.
5. Shri M. Krishnan.
6. Shri G. M. Nagarathnam.
7. Smt. Savithri.
8. Shri V. Chalapathy.
9. Shri Samuel Simon.
10. Shri S. Parthasarathy.
11. Shri T. V. Chalapathi Rao.
12. Shri S. Venkataramayya.
13. Shri G. N. Srinivasan.
14. Shri T. E. Srinivasan.
15. Shri V. Palani.
16. Shri K. T. Sundaresa Sarma.
17. Shri T. K. Subramaniam.
18. Shri M. S. Ramalingam.
19. Shri R. Parthasarathy.
20. Shri A. Subramaniam.
21. Shri C. R. Raghavan.
22. Shri C. Seetharama Reddy.
23. Shri P. Sreeramulu.
24. Shri Y. Rajagopala Rao.
25. Shri R. Venkatasubramaniam.
26. Shri A. C. Srinivasa Raghavan.
27. Shri D. Krishnamurthi.

Storekeepers :

1. Shri S. Ramamurthy.
2. Shri K. Sethuraman.

Lower Division Clerks :

1. Shri V. Veeraraghavan.
2. Shri S. Seshadri.
3. Shri M. Chandrasekaran.
4. Shri A. Venkatarathnam.
5. Shri M. R. Venkatesan.
6. Shri M. Balasubramaniam.
7. Shri S. Venkatesan.
8. Shri T. K. Ramanarayanan.
9. Shri S. Sugavanam.
10. Shri K. Narasimhulu.
11. Shri A. V. Narasimhan.
12. Shri T. R. Balasubramanian.
13. Shri C. G. Desikan.
14. Shri K. Rajagopalan.
15. Shri S. P. George Muller.
16. Shri R. Balasubramanian.
17. Shri B. L. Rajanna.
18. Shri S. Sainath.
19. Shri N. Krishnan.
20. Shri K. Venkataraman.
21. Shri Abdul Hakim.
22. Shri A. Surendra Singh.

Stenotypists :

1. Shri N. Srinivasan.
2. Kum. A. Lakshmi.
3. Shri T. Krishnamurthi.

Telephone Operators :

1. Miss Joan Garett.
2. Miss S. Vimala.
3. Shri S. Vaithianathan.

Drivers :

1. Shri R. Mahimai Doss.
2. Shri K. S. Vasudevan Nair.

Steward (Jr.):

Shri M. D. Devarajan.

Sergeant :

Shri R. F. McMurray.

Foremen :

1. Shri V. K. Vidyasagar.
2. Shri Henry Job.

Mechanics 'A' :

1. Shri D. Narasimhan.
2. Shri A. Govindarajan.
3. Shri P. D. Jayakumar.
4. Shri S. V. Subbarayudu.
5. Shri J. S. Kutbuddin.
6. Shri G. Balakrishnan.
7. Shri B. R. Kaliaperumal.

Mechanics 'B' :

1. Shri M. Sardar.
2. Shri P. Ayyadurai.
3. Shri K. Kothandam.
4. Shri K. Somasundaram.

Mechanics 'C' :

1. Shri N. K. Srinivasan.
2. Shri V. Sigamani.
3. Shri D. S. Srinivasan.

Draughtsmen :

1. Shri P. Chandrasekaran.
2. Shri D. Sundaram.
3. Shri A. Md. Idriskan Lodhi.
4. Shri V. Jayaraman.
5. Shri T. V. Srinivasan.

Workshop Supervisors :

1. Shri R. G. Thiagarajan.
2. Shri G. A. Venceslos.
3. Shri P. K. Sen.

Tracer :

Shri T. Thayuman.

Laboratory Attendants :

1. Shri P. Raghavalu.
2. Shri R. Gopal.
3. Shri E. Ganesan.
4. Shri K. Chakrapani.
5. Shri N. Subbarayan.
6. Shri S. Thangaiah.
7. Shri S. Panchanathan.
8. Shri N. Lakshmanan.
9. Shri K. Subbaiah Pillai.
10. Shri R. M. Manickam.
11. Shri K. Sivaraman.
12. Shri M. S. Srinivasan.
13. Shri M. Narayanan.
14. Shri G. Vedachalam.
15. Shri R. Kingsley.
16. Shri S. Alexander.
17. Shri G. Meenakshisundaram.
18. Shri A. Selvaraj.
19. Shri P. Veeraraghavan.
20. Shri C. Venkatesan.
21. Shri O. R. Krishnan Nair.

Store Attendants :

1. Shri K. Mohanarangam.
2. Shri K. Suryababu.
3. Shri A. Viswanathan.
4. Shri B. Sivanesan.
5. Shri M. P. Prabalam.
6. Shri K. Balaji Singh.
7. Shri K. Subramanyam.
8. Shri R. Seshadri.
9. Shri R. Parthasarathy.

Library Attendants :

1. Shri C. Lakshmanan.
2. Shri T. P. Thangavelu.

Daftry :

1. Shri V. Subramanian.
2. Shri N. Kanagasabai.

Peons :

1. Shri C. Ramu.
2. Shri K. Subramaniam.
3. Shri M. Muthuswamy.
4. Shri P. P. Balan.
5. Shri E. Balaraman.
6. Shri T. Lakshman.
7. Shri R. Chandran.
8. Shri K. Selvaraj.
9. Shri P. Narayanaswamy.
10. Shri K. Panchapakesan.
11. Shri R. S. Arumugam.

Cooks :

1. Shri M. Gopal.
2. Shri C. Kuttan.
3. Shri C. Murugesan.

Lift Operators :

1. Shri M. Doraiswamy.
2. Shri S. Chandrasekharan.
3. Shri R. Murugesan.
4. Shri G. Ranganathan.

Lascars :

1. Shri K. M. Ramareddy.
2. Shri P. Panchavarnam.
3. Shri K. Sriraman.
4. Shri A. Rathnam.
5. Shri S. Panchaksharam.
6. Shri C. P. Sreerama Dass.

Helpers :

1. Shri D. Arumugam.
2. Shri D. M. Devasahayam.
3. Shri K. Nagappan.
4. Shri T. Stainslas.

5. Shri G. Balakrishnan.
6. Shri N. Jayaraman.
7. Shri A. Ponnuswamy.
8. Shri Vijayasankaran.
9. Shri V. Chandrasekharan.

ENGINEERING UNIT

Executive Engineer :

Shri C. H. Gopal.

Assistant Engineers :

1. Shri K. Shankar.
2. Shri D. Ramanathan.

Draughtsman :

Shri P. Venugopalachari.

Wiremen :

1. Shri C. M. Janakiram.
2. Shri R. S. Mani.
3. Shri A. Periaswamy.
4. Shri P. Ramachandran.
5. Shri T. R. Santhanam.
6. Shri N. Somasundaram.

Pump Driver :

Shri M. Balaji.

List of Persons relieved during 1964-65

Registrar :

Shri R. Natarajan, I.A.S.

Assistant Professors :

1. Dr. T. Ramachandran.
2. Shri K. K. Shrivastava.

Lecturers :

1. Shri S. S. Das Gupta.
2. Shri C. J. Nagabhushana.
3. Shri M. Ramamoorthy.
4. Shri M. S. R. Sarma.

5. Dr. K. J. Shrivastava.
6. Dr. L. V. K. V. Sarma.*
7. Dr. B. V. Ramanamurthy.*
8. Dr. V. Srinivasan.*
9. Dr. V. Sivaramakrishnan.*
10. Dr. M. Satyanarayana.*
11. Dr. R. Vasudevan.*
12. Dr. K. Srinivasaraghavan.*

Associate Lecturers :

1. Shri B. R. Nagarajan.
2. Shri P. S. Sarma.
3. Shri V. Ramabhadran.*
4. Shri K. A. Bhaskaran.*
5. Shri S. Bhimasankara Sastry.
6. Shri K. Sankara Rao.*
7. Dr. H. S. Paul.*
8. Shri A. Ramamohan Rao.*
9. Shri A. Chandrasekaran.*
10. Shri V. V. Bapeswara Rao.*

Senior Technical Assistants :

1. Shri I. Suryanarayanamurthy.
2. Shri J. Ranganadha Sastry.
3. Shri Man Mohan Gupta.
4. Shri S. Ramakrishna Iyer.*
5. Dr. R. Subramanian.*
6. Shri S. Ramaswamy.*
7. Shri J. Jayasimhulu.*
8. Shri A. Baradarajan.*
9. Shri R. Subramanian.*
10. Shri A. B. Srinivasan.*
11. Shri T. S. Sathiamurthi.*

Junior Technical Assistants :

1. Shri D. Venkatasubba Reddy.
2. Shri M. T. Jose.

Assistant Librarian :

Shri P. S. Srinivasan.

Divisional Accountant :

Shri B. V. Raman.

Upper Division Clerks :

1. Shri T. R. Arunachalam.
2. Shri K. P. Nilakanta Pillai.
3. Shri D. Raghavan.
4. Shri M. K. Subramaniam.
5. Shri A. Subramaniam.
6. Shri D. Sankaralingam.
7. Shri S. Chandran.
8. Shri K. Natarajan.
9. Shri C. Narayanan Kutty.*
10. Kum. G. Saroja.*

Lower Division Clerks :

1. Shri K. Seshadri.
2. Shri K. Rajan.
3. Shri S. Babu Rao.
4. Shri K. Venkatasubramanian.
5. Shri M. Chandrasekaran.
6. Shri A. V. Narasimhan.
7. Kum. A. Lakshmi.
8. Shri T. Krishnamurthi.*
9. Shri N. Srinivasan.*

Store Keeper :

Shri T. J. Thomas.

Gestetner Operator :

Shri D. S. Srinivasan.*

Steno Typists :

1. Smt. Savithri.*
2. Shri S. Venkataramani.*

Mechanic 'A' :

Shri R. G. Thiagarajan.*

Mechanics 'B' :

1. Shri S. V. Subbarayadu.*
2. Shri T. K. Bose.
3. Shri V. Venkatapathy.
4. Shri Tarapada Pramanik.

Draughtsman :

Shri D. Radhakrishna Reddy.

Laboratory Attendants :

1. Shri N. K. Srinivasan.*
2. Shri Y. V. Ramanamurthy.
3. Shri K. K. Rajagopalan.
4. Shri S. P. George Muller.*
5. Shri K. Rajagopalan.*
6. Shri A. Nelson Samuel.
7. Shri N. Krishnan.*
8. Shri B. Dhal Badur Maricar.
9. Shri R. A. Thambidorai.
10. Shri K. N. Kathiravelu.

Peons :

1. Shri R. Sundaramurthy.
2. Shri K. Sundaram.

Chowkidar :

Shri R. Irusappan.

ENGINEERING UNIT

Assistant Engineer :

Shri A. Abdul Khader.

Supervisor :

Shri R. Sethunarayanan.

Junior Engineer :

Shri K. Ananthanarayanan.

Draughtsman :

Shri M. Masilamani.

* on appointment to a higher post in the Institute.

List of Staff Members who had proceeded abroad on assignments or for higher training or returned to duty during 1964-65.

Name of the Trainee (1)	Subject (2)	Country where training course is undertaken (3)	Date of relief (4)	Date of rejoining duty (5)	Nme of Programme under which training facilities were declared (6)
Shri C. Rajasekaramurthy, Lecturer, Mechanical Engineering	Power Engineering (MECH).	U.S.A.	22-12-1964	..	For higher studies on his own initiative.
Shri M. C. Gupta, Assistant Professor, Mechanical Engineering	Combustion Engineering	U.S.A.	25- 1-1965	..	Deputation under the U.S. Aid Programme 1964.
Shri K. S. Sankaran, Assistant Professor, Civil Engineering	Soil Mechanics & Foundation Engineering	U.S.A.	25- 1-1965	..	-do-
Shri B. Ramaswamy, Lecturer, Electrical Engineering	Electrical Engineering	U.S.A.	19- 1-1965	..	-do-
Shri N. R. Rajappa, Lecturer, Department of Allied Mechanics	Aeronautics	U.S.A.	10- 9-1964	..	For higher studies on his own initiative.

(1)	(2)	(3)	(4)	(5)	(6)
Dr. S. Ramaseshan, Professor and Head of the Department of Physics	Crystallography	U.K.	2- 9-1964	25- 9-1965	Fellowship in Chemical Crystallography Laboratory, Oxford, offered by the Department of Scientific and Industrial Research of Great Britain.
Dr. K. Ramananda Rao, Lecturer, Department of Chemical Engineering	Chemical Engineering (Gas & Oil Technology)	West Germany	1- 5-1965	..	To attend International Seminar for research and education in Chemical Engineering and Physical Chemistry sponsored by UNESCO.
Dr. M. Satyanarayana, Assistant Professor, Department of Chemical Engineering	Chemical Engineering	U.S.A.	25- 9-1963	10- 8-1964	For higher studies on his own initiative.
Shri P. S. Srinivasan, Lecturer, Mechanical Engineering	Fluid Mechanics	West Germany	5- 5-1962	24-10-1964	Deputed for advanced training under the Training Programme in West Germany under the Indo-German agreement.
Shri S. Padmanabhan, Lecturer, Mechanical Engineering	Switch Gear and Instrument Technology	West Germany			-do-

APPENDIX IX

List of Distinguished Visitors to the Institute

Messrs. Y. V. Gankovsky and V. N. Meskelonke, Soviet Scientific workers.	21- 8-1964
Dr. H. R. Ambler, Scientific Adviser to the British High Commissioner, New Delhi.	28- 9-1964
Prof. G. Somers, Director, Industrial Relations Research Centre, University of Wisconsin, Madison, U.S.A.	12-10-1964
Mr. J. M. Milligan, Specialist in Technical Education, Ministry of Education, United Kingdom.	5-11-1964
Shri S. K. Banerji, Ambassador of India to West Germany.	11-11-1964
Prof. Tchaikovsky, Head of Unesco Mission, Coimbatore.	25-12-1964
Dr. J. Martinic, Rector, 17th November University of Prague.	8- 1-1965
Mr. Holzheimer and Mr. Adams (German Academic Exchange Service, Bad Godesberg), Dr. Hessberger, German Academic Exchange Service, Indian Branch, New Delhi.	12- 1-1965
Japanese Youth Goodwill Mission led by Mr. Takeshi Mamiya, Professor, Department of Liberal, Yokohama, National University, Japan.	19- 1-1965
Dr. V. Filkoran, Rector, Komensky University, Czechoslovakia.	23- 1-1965
A team of leading West German Industrialists led by Dr. Hans Kuntze, General Manager, Klein Pumpen GmbH.	28- 1-1965
Mr. T. Craig, Asst. Secretary, Association of Commonwealth Universities, London.	4- 2-1965

Dr. G. G. Mukhin, U.S.S.R. Friendship University, Moscow.	9- 2-1965
Shri V. C. Vijayaraghavan, Consul-General of India, Frankfurt, West Germany.	10- 2-1965
Mr. V. A. Venikov, Head of the Electrical Systems, Moscow Power Institute, Moscow.	11- 2-1965
Miss Mary Olm Stead, First Secretary, American Embassy, New Delhi.	23- 2-1965
Dr. A. G. Smirnov, Friendship University, Moscow.	8- 3-1965
His Excellency Mr. Kurt Georg Kiesinger, Chief Minister of Badan Wuerttemberg, West Germany, Dr. Rudolf Kisel, Honorary Consul-General of India, Stuttgart, West Germany.	20- 3-1965
Prof. Patterson, Director of Research, Institute of Metallurgy, University of Aachchen, West Germany.	22- 3-1965
German Parliamentary Delegation (Messrs. Atzenroth, Knorr, Wittmer-Eigenbrodt, Rauhaus, Kahn-Ackermann, and Freyh.)	12- 4-1965
Shri V. S. Karmali, Minister for Education, Goa.	2- 4-1965
Air Commodore S. A. Hussain, Director of Training, Air Headquarters, New Delhi.	29- 5-1965
Mr. Mallam Shebu Abubakkar Daura, Provincial Secretary for Education, Nigeria.	10- 6-1965

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