



JOURNAL OF THE ASSOCIATION OF ENGINEERS

GOLDEN JUBILEE ISSUE, 1919—1969

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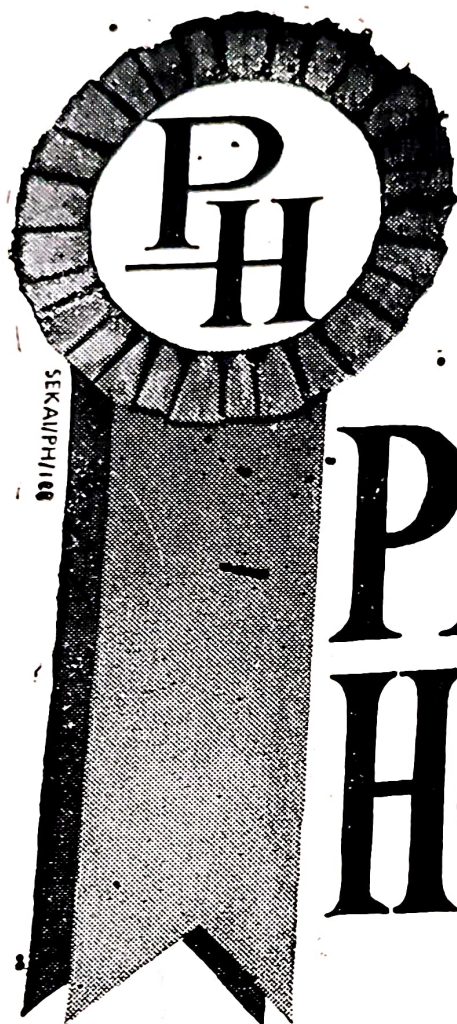
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CALCUTTA

GOLDEN JUBILEE

OF

THE ASSOCIATION OF ENGINEERS

INAUGURATION ●

27 Sept. '69 at

RABINDRA SADAN

SEMINAR SESSIONS ●

28 Sept.—30 Sept. '69 at

**GEOLOGICAL SURVEY OF
INDIA AUDITORIUM**

27, Chowringhee, Calcutta.

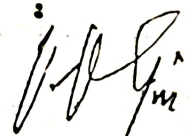
राष्ट्रपति भवन, नई दिल्ली-4.
RASHTRAPATI BHAVAN.

NEW DELHI-4.

August 28, 1969.

of 23rd August. I am afraid
to visit Calcutta on the 27th
for the period has already
wish the Golden Jubilee of
very success.

Yours sincerely,


(V.V. Giri)



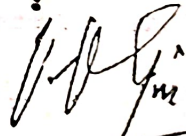
राष्ट्रपति भवन, नई दिल्ली-4.
RASHTRAPATI BHAVAN,
NEW DELHI-4.

August 28, 1969.

Dear Sir,

Thank you for your letter of 23rd August. I am afraid it will not be possible for me to visit Calcutta on the 27th September as my programme for the period has already been fixed up. I, however, wish the Golden Jubilee of the Association of Engineers every success.

Yours sincerely,


(V.V.Giri)

Shri S. K. Neogi,
Hony. Secretary,
The Association of Engineers,
24, Netaji Subhas Road,
Calcutta-1.



RAJ BHAVAN,
CALCUTTA

September 9, 1969

I am glad to learn that the Association of Engineers, Calcutta, will be celebrating their Golden Jubilee for four days from 27th of this month.

I send my greetings and good wishes to the members of the Association on this occasion and wish the Golden Jubilee programme all success.

D. N. Sinha
Governor of West Bengal



PRIME MINISTER



MESSAGE

The pace of the modernisation of our country and the improvement in the lives of our people depend to a great extent on the ability, devotion and resourcefulness of our engineers. They are agents of the process of change and bring science into the lives of the people.

My good wishes to the Association of Engineers on its golden jubilee.

Indira Gandhi

(Indira Gandhi)

New Delhi,
July 26, 1969.

The Association of Engineers

COUNCIL FOR 1969

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Sri Kapil Bhattacharjee
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Sri S. K. Ghosh



CHIEF MINISTER

WEST BENGAL

CALCUTTA

July 30, 1969.



The Association of Engineers is celebrating its Golden Jubilee this year. There will be an Engineers Conference on this occasion ; some of the important subjects for discussion among others will be unemployment problem among technologists, training and education of engineers and the problems of professional technical bodies. This will be a useful discussion.

I send my greetings and good wishes to the occasion.

Ajoy Kumar Mukherji

Ajoy Kumar Mukherji

GOLDEN JUBILEE COMMITTEES 1969

Sri P. C. Bose Chairman
„ S. K. Neogi General Secretary.

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„ P. Kundu Member

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Sri Rusi B. Gimi. J. D.

Employment Registration

Sri D. M. Dey, Secretary
&
All other Council Members



**DEPUTY CHIEF MINISTER
WEST BENGAL**

CALCUTTA, THE *September 5, 1969.*

Shri Jyoti Basu

No—9020 D.C.M.

I wish your Golden Jubilee Celebration a success.

Jyoti Basu
(Jyoti Basu),

Deputy Chief Minister

The Association of Engineers

GOLDEN JUBILEE PROGRAMME

PLACE : CALCUTTA

27th September, 1969
Saturday

9-30 A. M. : Registration of Delegates
10-30 A. M. : Inauguration
President : **Dr. B. D. Nag Choudhury**, Member,
Planning Commission

Chief Guest : **Sri Sushil Kumar Dhara**,
Minister, Commerce & Industries

12-00 Noon : Light refreshment
6-00 P. M. : Film Show at USIS Auditorium

28th September, 1969
Sunday

10-00 A. M. : Seminar Session
to Sub : a) Education and Training of Engineers
1-00 P. M. : b) Specialisation

President : **Sri P. R. Guha**, Ex-Chairman,
Institution of Engineers, Bihar Centre

Chief Guest : **Sri Biswanath Mukherjee**, Minister, I & W,
West Bengal

11-15 A. M. : Coffee Break
1-00 P. M. : Lunch
2-00 P. M. : Visit to Industries
6-00 P. M. : Drama, "ALEEK BABU", at Calcutta Information Centre

29th September, 1969
Monday

10-00 A. M. : Seminar Session
to 1-00 P. M. : Sub : Technologists, Industry & Agriculture

President : **Dr. A. N. Ghosh**, Director General,
Indian Standards Institution, New Delhi

Chief Guest : **Sri Somnath Lahiri**, Minister, Development &
Planning, West Bengal

11-15 A. M. : Coffee Break
2-00 P. M. : Visit to Industries
7-00 P. M. : Dinner at Park Hotel

30th September, 1969
Tuesday

10-00 A. M. : Seminar Session
to 1-00 P. M. : Sub : Unemployment Problems amongst Engineers

President : **Sri R. G. Deo**, Director General, Mines Safety,
Government of India

Chief Guest : **Sri Jyoti Bhusan Bhattacharjee**, Minister,
Information & Public Relations, West Bengal

11-15 A. M. : Coffee Break
3-00 P. M. : Seminar Session
Sub : a) Problem of Professional Technical Bodies,
b) Importance of Joint Engineering Council for Technical
Bodies

President : **Sri R. B. Chakraborty**, Director, C.M.W.S.A.
Calcutta

Chief Guest : **Sri Sambhu Charan Ghosh**, Minister,
Cottage & Small Scale Industries, West Bengal

5-00 P. M. : Tea
6-30 P. M. : Dance Drama, "MAHUA" at Academy of Fine Arts
Auditorium

MINISTER-IN-CHARGE
INFORMATION & PUBLIC RELATIONS DEPARTMENT
GOVERNMENT OF WEST BENGAL
WRITERS' BUILDINGS
CALCUTTA-1



মন্ত্রী
তথ্য ও জনসংযোগ বিভাগ
পশ্চিমবঙ্গ সরকার
রাইটার্স বিল্ডিংস্
কলিকাতা।

I am glad to learn that the Association of Engineers is going to celebrate its Golden Jubilee in Calcutta in September 1969.

In a developing country like ours, where resources are limited and wants are many, social and economic progress calls for an all-round mobilisation of natural and human resources. The Association of Engineers would do a great service to the country if it can instil a sense of devotion in the minds of its members for the objectives of social progress.

I wish the Association a long life and great success.

J. Bhattacharya
(J. Bhattacharya)

To :
Sri S. K. Neogy,
Hony. Secretary,
The Association of Engineers,
24, Netaji Subhas Road,
CALCUTTA-1.

Golden Jubilee Secretariat

Year 1969

- | | |
|---------------------------------|---|
| 1. General Secretary : | Sri S. K. Neogi |
| 2. Public Relations : | „ P. Kundu Member |
| 3. Reception : | „ T. K. Basu Secretary
„ Sreemohan Mundra Member
„ G. P. Choudhury Member |
| 4. Finance : | „ M. N. Ghosh Secretary |
| 5. Souvenir : | „ P. K. Ghosh Secretary
„ A. K. Mazumdar Member |
| 6. Seminar : | „ A. K. Bhunia Secretary
„ M. Banerjee Addl. Secretary |
| 7. Entertainment : | „ G. Banerjee Secretary
„ B. Manna Member |
| 8. Refreshment : | „ P. C. Sinha Member |
| 9. Co-ordination : | „ S. K. Mukherjee Secretary |
| 10. Employment & Registration : | „ D. M. De Secretary |



মন্ত্রী

শিল্প ও বাণিজ্য দপ্তর এবং কৃষি-শিল্প সংস্থা

পশ্চিমবঙ্গ

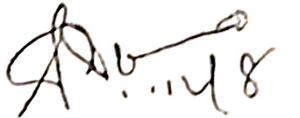
August 12, 1969.

MINISTER-IN-CHARGE

DEPARTMENT OF COMMERCE AND INDUSTRIES
AND
AGRO-INDUSTRIES CORPORATION
WEST BENGAL

I am glad to learn that The Association of Engineers is going to celebrate its Golden Jubilee at Calcutta in September, 1969. The Engineers have a most vital role to play in the development of our country and for the upliftment of our society.

I wish all round success of the Celebration.


(S. K. Dhara)

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EMBASSY OF THE
UNITED STATES OF AMERICA
New Delhi, India

August 8, 1969

Mr. S. K. Neogi, Secretary
The Association of Engineers
24 Netaji Subhas Road
Calcutta-1

Dear Mr. Neogi :

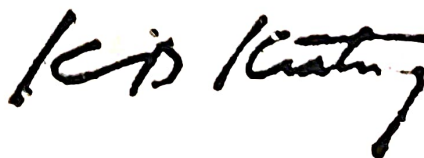
The President has asked me to reply on his behalf to your letter of August 5.

Engineers are by inclination and profession the builders of society. Not only a nation's monuments and artifacts, but much of its ultimate growth and progress, rest in the hands of its engineers.

That the Indian nation has progressed so far, so fast, is a tribute, then, in no small part, to the quality of its engineers.

Please accept my congratulations and warm best wishes on the occasion of your 50th anniversary.

Very sincerely yours,



Kenneth B. Keating

FACTS TO REMEMBER

- ★ Indian quinine is now the single biggest foreign exchange earner in the drugs and pharmaceutical group.
- ★ Prior to 1st April 1964 Indian quinine could hardly compete in the international markets.
- ★ Since 1st April 1964 the picture changed completely and Indian quinine began to be exported in appreciable quantities earning sizeable foreign exchange :

YEAR.	Export of Quinine & allied products from India (in Million Rupees)	Total exports of drug & pharmaceuticals from India (in Million Rupees)	Share of Quinine alone.
1964-65	4.676	22.242	21.02 %
1965-66	10.992	30.359	36.21 %
1966-67	17.708	37.543	47.15 %
1967-68	9.870	36.440	27.08 %
1968-69	9.610	Not available	Not available

- * There are only two factories in India
One in Tamil Nadu and the other in Mungpoo. West Bengal Government's Mungpoo Quinine Factory is bigger of the two and produces about 60% of India's total quinine manufacture and thus earns the major part of the foreign exchanges shown above.

Inserted by :

DIRECTORATE OF GINCHONA
COMMERCE & INDUSTRIES DEPARTMENT
GOVERNMENT OF WEST BENGAL
CALCUTTA.

EDITORIAL



It is a very pleasant task to write an editorial on a pleasant occasion and for that matter, the occasion of the Golden Jubilee of the Association of Engineers is the most pleasant in the span of fifty years. Art is long but life is short. Fifty years is not a long period but the history of these fifty years is piquant. The Association has grown to adolescence in these years. Those who nursed it from the embryo stage are no more with us but on this happy occasion, we recall their sacrifice and service and pay our homage. Let the light kindled by them burn unabated. It has withstood many storms—storm from defections, apathy of rulers, jealousy of foreigners. The weathering has made the Association all the more sturdy. It initiated the All-India Engineers' Conference, it led the formation of Joint Council of Professional Engineering institutions. It sent delegates to overseas conference. Today its membership includes Indians in overseas. The glamour of foreign institutions could not deflect the affection of the sons of soil from their "own" institution, in the motherland.

The issue of this number of the journal is dedicated as the Golden Jubilee Souvenir.

Salt Lake Township

A developing modern township near V.I.P. Road, Calcutta (about 5 miles from Esplanade) with sewerage, underground drain, pipe water supply, wide roads, electricity, extensive parks, green belts, easy transport facilities offers excellent opportunity of residential accommodation at moderate rates ; welcomes traders and businessmen to book commercial plots at reasonable rates having good prospects of business. A few residential plots of 4 to 10 cottahs in Sector I, which is almost complete, are still available on lease for 999 years.

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For details enquire of Deputy Secretary, Irrigation and Waterways Department, Writers' Buildings, Calcutta-1, by sending a self-addressed envelope (25 cm. X 11½ cm.) bearing 35 paise postage stamp.

[FEATURE AD.]

Our Chief Guests

of Various Sessions



Sri Sushil Kumar Dhara,
Minister, Commerce &
Industry, West Bengal



Sri Jyoti Bhusan Bhattacharya,
Minister, Information & Public
Relations, West Bengal



Sri Sambhu Charan Ghosh,
Minister, Small Scale Industries,
West Bengal

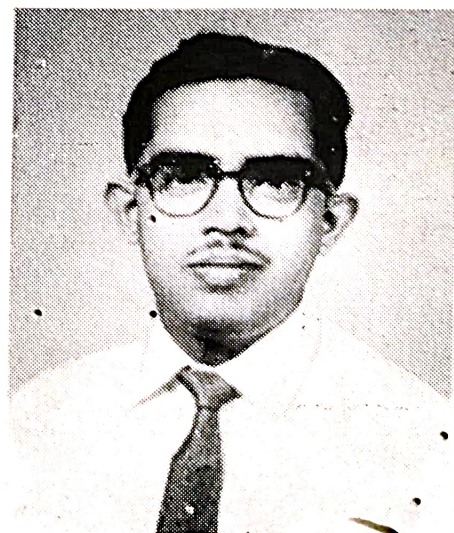


Sri Somnath Lahiri,
Minister, Development &
Planning, West Bengal



Sri S. Basu,
President,
1969

**THE
ASSOCIATION
OF
ENGINEERS**



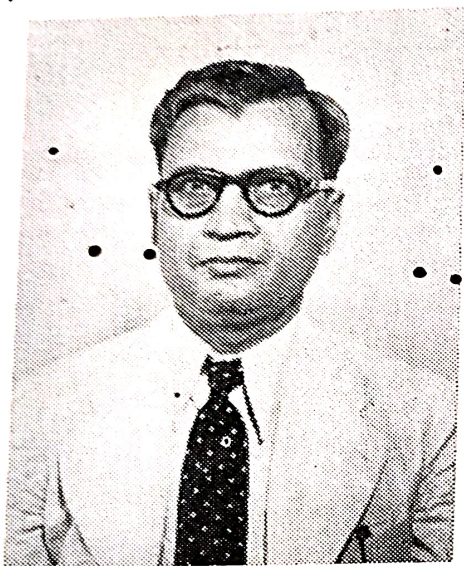
Sri S. K. Neogi, Hony. Secretary.

PRESIDENTS OF THE

SEMINAR SESSIONS



Dr. B. D. Nag Chaudhury,
Member, Planning Commission,
New Delhi.



Sri P. R. Guha,
Ex-Chairman, Institute of Engineers (India)
Bihar Centre.



Dr. A. N. Ghosh,
Director-General,
Indian Standards Institution.



Sri R. G. Deo,
Director-General, Mines Safety,
Govt. of India.



Sri R. B. Chakraverty,
Director, Calcutta Metropolitan Water &
Sanitation Authority, Calcutta.

ORIGIN AND GROWTH OF THE ASSOCIATION OF ENGINEERS

SISIR NEOGI, B.E., M.E.(P.H.), A.M.A.E., M.I.W.W.A.

Secretary, The Association of Engineers

A.D. 1918. Old boys of Sibpore Engineering College (now known as B. E. College) have come to attend the annual Reunion. Reunion meeting was over and dinner was scheduled at 8 p.m. So, the interval of gay evening was opportune for an informal get-together in the spacious greens of the beloved college. Gossip, tittle-tattle, chat, pleasant retrospection of good old days, reminiscence of chums and teachers, marked the occasion. In one such groups, someone became rather serious or constructive and proposed that they should meet on many more occasions in such atmosphere, to have happy time out of work. He was none other than Jatindranath Banerjee and his proposal received spontaneous applause. Not in mere words but in actions too—Chandrakanta Ghosh at once invited all present to his house (10 Rammohan Roy Road) the next week end, to work out the idea. They met, talked at subsequent weekend also. Number of promoters swelled and financial solvency was attained from donations. A spatial flat in the second floor was rented in Mirjapur Street (now Surjya Sen Street) near college square.

There were regular gatherings in this flat. One evening Narendra Kumar Bhattacharjee, Asstt. Chief Electrical Inspector to the Govt. of Bengal, who was an Associate member of the Institution of Electrical Engineers, England, proposed that their organisational set up should be on the same lines as the British Institution but the term "Institution" should be replaced by "Association". The proposal was heralded unanimously and immediately a committee was

formed with Narendra Kumar Bhattacharjee as chairman and Chandrakanta Ghosh, Jatindranath Banerjee, R. K. Ganguly, Jogeshchandra Ganguly and few others as members. They drafted the memorandum and formed committee.

The plenipotentiary committee consisted of Satishchandra Mitra, Chief Engineer, Calcutta Corporation as chairman; Sureshchandra Sanyal, District Engineer, Calcutta Corporation as secretary; Jogeshchandra Ganguly, Asstt. Engineer, Braithwaite Co. as assistant secretary; Jatindranath Banerjee, Building Surveyor, Calcutta Corporation as treasurer. Satishchandra Mitra could not serve long. So, Dr. S. K. Dutta on his return from Germany, took over. He was the first President of the Association. Dr. Dutta was a teacher in Sibpore College prior to his departure for Germany. With his experience abroad, he started with full vigour to put the Association on sound footing, but his untimely death was a blow to the Association. His place was taken by Prof. B. C. Gupta, Head of the electrical engineering department of Sibpore Engineering College and the only Indian Professor. At his instance, engineers from Sibpore College joined in large numbers. In those days Sibpore Engineering College was the solitary institution in Burma, Assam, Bihar, Orissa, Madhyapradesh, Nepal and Calcutta University was the only University.

Sibpore engineers were joined by another group of engineers who studied engineering in U. K. and were mostly graduates of Glasgow.

news through journal and reading of papers;
(4) establishment of a library.

The activities of young Indian engineers did not escape the eyes of alien rulers. British engineers in this country were up in their loins to form an institution of their own. They did not deviate from the policy of 'divide et impera' and could successfully rope in Sir Rajendra Mukherjee of Martin & Co., though he had no engineering degree. Attempts were made to foil the British design by impressing on Sir Rajendra Mukherjee to dissociate himself from the British move and work for the Association of Engineers. He did not yield to requests. So, the Association had to struggle from the very inception. In one of their meetings, the British President of the Institution of Engineers, made some offending remarks about Indian Engineers and as a protest, many self-respecting Indian engineers severed their connection; under the leadership of Rai Bahadur Girish Chandra Das, Chief Engineer, Martin & Co., who worked till the last day of his life for the Association of Engineers.

With the expansion of sphere of activities, engineers from other provinces became members of the Association. It was, at this stage, considered prudent to give the Association an All-India character, by deleting the suffix "Bengal" and registering it under the Societies Act as "Association of Engineers". The seed planted in the green lawn of Sibpore College, thus developed to a small plant. Sri Suresh Chandra Sanyal was the first secretary and Sri Jogesh Chandra Ganguli was the first editor. Sri Jogesh Chandra Banerjee, the Vice President, got the Association affiliated to the Bengal National Chamber of Commerce and Industry. In the year 1932, the Association applied to the Corporation of Calcutta for 13 cottas of land for construction of museum, library and night school. In the year 1934, syllabus

University. They were frustrated to find that foreigners with much inferior qualifications could vie with them and secure job and with comparatively higher foreign qualifications, they were vanquished in the struggle for existence. They joined the Sibpore engineers to make the Association a strong forum and pioneers of the Association are engineers from Sibpore and Glasgow.

A. D. 1919. It was fourteen years after the movement for unsettling the partition of Bengal and two years ahead of national awakening, throbbing for struggle for emancipation. Like others, Indian engineers were also victims of differential treatment in the hands of foreign administration. Industry was in the hands of foreigners who imported covenanted hands from home. Less qualified people, from abroad and particular community in India, could get a job in foreign concern or even in Government department, in preference to qualified Indian engineers. Railways were run by private companies incorporated in England. There were two grades for same responsibility—one for Indian and one for Anglo-Indian and European. Even in the amenities in public utility concern, there were discrimination. There was "European third class" with first class amenities and third class fare. In Government service, if an Indian could rise as the chief engineer, it was deemed an exception. Silhouetted against such environment, qualified young engineers found enough grouse to organise themselves to fight it out.

The constitution of the Association was drawn up on the same lines as the Institution of Civil Engineers, the oldest institution in the world. It was named the "Association of Engineers (Bengal)". The main objects were : (1) safeguarding and promoting the status of engineers ; (2) research for development of engineering ; (3) dissemination of engineering

for examination of candidates for membership of various grades was prepared. The Association representative Rai Bahadur Girish Chandra Das was connected with engineering faculty of the Calcutta University. Professor S. P. Ganguli of Mellegan College, Lahore initiated the compilation of engineering terms in Bengali and these were published regularly in the Association Journal. The 'Paribhasha Samsad' of the West Bengal Government sought assistance of the association regarding compilation of technical terms and these were duly complied with. Among the vanguards of the Association, the names of Rai Bahadur Girish Chandra Das, Rai Bahadur Amarnath Das, Dr. B. N. De, S. N. Ghosh, Jiten Das Gupta, P. C. Bose, Sachin Bandopadhyay, Haren Banerjee, Kalidas Roy, Nagendranath Sen, Dr. J. N. Basu, Amulya Sen will remain written in letters of gold for their sincere effort to advance the cause of the Association.

The Silver Jubilee was celebrated with due pomp.

In the year 1949, an application was submitted to the Government of India for award of charter to which the Govt. made a counter proposal for merging with the Institution of Engineers. This proposal was discarded though there were many Government service holders in the Association. The application form of the Institution of Engineers contained a clause "When did you arrive in India", which implies, beyond doubt that the Institution of Engineers is foreign-based and owes allegiance to England. Members of our Association could not accept a proposal derogatory to the self respect of Indians. The Association did not get a charter and could not enroll students in thousands. Neither its membership could be used as a passport for securing Government jobs. In spite of this the Association has lived for fifty years.

In the year, 1962, some interpellations were

made during the budget session, regarding the recognition of the oldest India-based organisation. Sri Humayun Kabir, replied on behalf of the Government that request for recognition "has not been accepted so far". How far is "so far" is now the question to be reckoned. Of course, Sri Kabir indicated out of Lok Sabha that the obstacle for recognition was coming from another institution which wants monopoly in the matter. There were comments in Ananda Bazar Patrika, Jugantar, Swadhinata and other papers for Govt. recognition.

In the year 1963, two representatives of the Association met Sri P. C. Sen, Chief Minister of West Bengal on the 10th August. Verbal assurance of grant for Library was given by the chief minister but nothing was forthcoming. Of course, the education ministry at the centre, encouraged us for continuation of activities for "promotion of engineering knowledge and engineering profession". In 1963, the foreign ministry requested for sending delegate to the Afro-Asia housing congress at Ciaro and delegate of the Association of Engineers attended the Cairo congress. Observer was sent to the British fair. A delegate was nominated to the International conference in Japan. These are illustrations to show Govt. recognition.

In the year 1968, the Association took the initiative for convening the first All India Engineers' Conference. The Joint Council of professional engineering bodies also owes its existence at the initiative of the Association.

Fifty years may appear too long a period but in the march of time, 50 years is not a long stride to achieve total success. Our relentless struggle will continue, with the sympathy of our people.

We celebrate the Golden Jubilee now and would hope for the centenary celebration with greater achievement, more eclat.

MEMORANDUM OF ASSOCIATION

1. The name of the Association is "The Association of Engineers."
2. The Registered Office of the Association will, for the present, be located at 24, Netaji Subhas Road, Calcutta-1. The registration number, under Act XXI of 1860, is 4998 of 1924.
3. The objects with which the Association has been formed are :—

I. To improve the status and forward the interests of Engineers and the profession of Engineering generally and particularly of the members of this Association.

II. To promote the general advancement of the science of Engineering and allied subjects and facilitate the exchange of information and ideas on these subjects amongst the members of the Association and for this purpose :—

(i) To hold meetings for reading and discussing papers bearing on Engineering or allied subjects.

(ii) To print, publish, sell and distribute the proceedings and reports of the Association or any papers, communications, works or treatises on Engineering or allied subjects in English or other language or any abstracts thereof or extracts therefrom.

(iii) To establish an Engineering Library and take charge of books, pamphlets, publications and manuscripts, etc., of the Library of the Association.

III. To create an atmosphere of Engineering culture and to promote inventions and researches in Engineering or allied subjects by making grants of money, books or apparatus and in other ways.

IV. To co-operate with other Engineering Associations or Institutions of this or other countries whose objects are similar to those of this Association.

V. To purchase, take on lease or otherwise

acquire and also let on lease or otherwise dispose of any premises or other property for the purpose of the Association subject to the provisions of the rules and of Government of India Acts regulating registered Associations.

VI. To establish a Rest house for members who do not reside in Calcutta but may come here for private purposes or for the purpose of the Association requiring a short stay.

VII. To organise an employment bureau, keep in touch with the employers and the members of the Association and thus to help the employers in quickly securing suitable men and to assist any member who may, for the time being, be in need of employment.

VIII. To collect, tabulate, print and sell or distribute information helpful for the promotion and improvement of industry and to help the industries of the country with technical advice, etc.

IX. To promote social intercourse among Engineers and Technologists.

X. To co-operate with Engineering Institutions, Railways, District Boards, Municipalities, Mining Boards, Govt. departments, Planning Organisations.

XI. To provide indoor games and common room for recreation.

XII. To do such other lawful things as are incidental or conducive to the attainment of the above objects.

ARTICLES OF ASSOCIATION

(AS AMENDED UP TO MARCH, 1969)

PRELIMINARY

1. The Membership of the Association shall be unlimited.

2. These Articles of the Association shall come into force from the 1st March, 1921, and shall continue to remain in force until they are modified by a resolution of a General Meeting of the Association after duly notifying such to every member and fully considering their views.

3. The Association may have Honorary Members and shall have Members and Associate Members who shall be known as Corporate Members and Associates, Graduates and Students who shall be known as non-Corporate Members. It may also have Patrons and Donors and Technical Corporate Members.

4. The Members of the different classes already existing as it is on the 1st March, 1921, and such other persons as shall be admitted, in accordance with the Articles, and none others, shall be or become Members of the Association (either as Honorary Members, Members, Associate Members, Associates, Graduates or Students or Technical Corporate Members as the case may be) and be entered on the Register as such.

5. The rights and privileges of every member of any class shall be personal to himself, and shall not be transferable or transmissible by his own act or by operation of law.

6. No Honorary Member, Associate Member, Associate, Graduate or Student shall

by reason of being legally a member of the Association be entitled to any privileges other than those which by the Articles, attach to the specific class of members of the Association to which he belongs, and wherever the term "Member" is herein used without qualification, it shall be taken to exclude Honorary Members, Associate Members, Associates, Graduates, Students and Technical Corporate Members.

7. The Association may admit such other persons and organisation as may be hereafter qualified and elected in that behalf as Honorary Members, Members, Associate Members, Associates, Graduates, Students and Technical Corporate Members respectively.

DONORS

Any person who may take an interest in the Association and make a donation to the funds of the Association a sum of Rs. 100/- or more, may on the recommendation of the Council, be elected a Donor of the Association at a General Meeting; such election may be for life or for a definite term.

ABBREVIATIONS

The authorised abbreviations indicating the class in the Associations to which any person belongs shall be as follows :—

For an Honorary Member	... Hons. M.A.E.
„ a Member	... M.A.E.
„ an Associate Member	... A.M.A.E.
„ a Tech. Corporate Member	... T.C.M.A.E.
„ an Associate	... Associate A.E.
„ a Graduate	... Graduate A.E.
„ a Student	... Student A.E.

No person or organisation shall adopt or describe himself by any other abbreviation to indicate the class to which he belongs than that provided in this article.

DIPLOMAS

Subject to such regulations and on payment of such fees as the Council may from time to time prescribe, the Council may issue to any member of any class (except students) a certificate showing the class to which he belongs. Every such certificate shall remain the property of, and shall, on demand be returned to the Association.

HONORARY MEMBERS

Any Engineer who, in the opinion of the Council, is of eminent position and attainments and whom the Association specially desires to honour for exceptionally important services in connection therewith may be elected as an Honorary Member.

MEMBERS

Every candidate for election or transfer to the class of Member shall satisfy the Council :—

(i) That he is not less than 35 years of age.

(ii) That he is engaged in the profession of engineering in a position of high responsibility, or has retired from this profession after having held a position of high responsibility.

and (iii) That he has at least one of the following qualifications :—

(a) He is an Associate Member of the Association and has had at least five years'

experience in a position of superior responsibility and distinction.

(b) Or, he has had adequate education and training in Engineering and has had experience involving responsibility for at least ten years out of which five years has been in a position of superior responsibility and distinction.

(c) Or, he is a member of an engineering Institution or Society membership of which, in the opinion of the Council, is proof of suitable technical qualifications and experience.

(d) Or, he is a person of eminence in the profession of engineering.

NOTE :—In considering the qualifications of candidates, responsible charge in engineering teaching and on research may be regarded as position of superior responsibility.

ASSOCIATE MEMBERS

Every candidate for election or transfer to the class of Associate Members shall satisfy the Council :—

(a) That he is not less than 25 years of age.

(b) That he has passed the examination for Associate Membership prescribed by the Council or has been exempted from the examination having passed such other examination or examinations which are recognised by the Council as equivalent to their own examination, Vide rule 7 of the Rules and syllabus for examination.

(c) That he has engineering training and practice for not less than five years out of which at least one year has been spent in a position of responsibility.

TECHNICAL CORPORATE MEMBER

Technical Corporate Member shall be a registered commercial or industrial undertaking, a Department of the Central or State Government, a local body, an institution, a recognised statutory body or a company/firm interested in the development of Engineering activities. Technical Corporate Members shall enjoy all the privileges of Members and Associate Members excepting that they will not have voting rights. The annual subscription for the Technical Corporate Membership shall be Rs. 200/-

ASSOCIATES

Every candidate for election to the class of Associates shall satisfy the Council :—

(a) That he is not less than 35 years of age.

(b) That though not an engineer by profession he has attained a position in a special pursuit allied to engineering as would further the cause of engineering knowledge and practice.

GRADUATES

Every candidate for election or transfer to the class of Graduates shall satisfy the Council :—

(a) That he is not less than 21 years of age.

and (b) That he has graduated from an Engineering College or University or Institution recognised by the Council or has passed the A & B Section of the examination of the Association or an equivalent examination recognised by the Council, vide rule 6 of the Rules and Syllabus for examination.

STUDENTS

Every candidate for election to the class of Students shall satisfy the Council :—

(a) That he is not less than 18 years of age.

and (b) That he is or has been a student of engineering at one of the Universities, Colleges or Schools recognised by the Council.

Or, That he is or has been an engineering pupil, apprentice or assistant under the supervision of a Corporate Member or any engineer recognised by the Council and has passed the preliminary Examination of the Association or equivalent examinations recognised by the Council, vide rule 5 of the Rules and Syllabus for examination.

Every student shall be entitled to remain in the class of students during the pleasure of the Council, but in no case beyond the 30th day of June next following the day on which he attains the age of 26.

ELECTION OF NEW MEMBERS

Honorary Members shall be elected by the Association on the recommendation of the Council.

Members of all classes (except Honorary Members) shall be elected at the ordinary meeting of the Council by the Corporate Members present, and the election shall be by ballot. The proportion of votes necessary for the election of any candidate shall be at least two-thirds of the total number of votes given and such election shall be announced at the next meeting of the Association and published in the Bulletin of the Association.

Candidates for election shall be proposed and supported as provided hereunder, from personal knowledge and in writing, according to a form approved by the Council :—

(a) Any person desirous of election as a Member, Associate Member or Associate shall be proposed by one Corporate Member and supported by three Corporate Members ;

(b) Any person desirous of election as a Graduate shall be proposed by one Corporate

Member and supported by one Corporate Member ;

(c) Any person desirous of election as a Student shall be proposed by one Corporate Member.

For the purposes of this Article any member of any class while serving on the Council shall be deemed to be a member.

In the event of a candidate residing abroad being unable to obtain the requisite signatures. the signature of the Local Honorary Secretary and of one Corporate Member or alternatively of two Corporate Members, in each case from personal knowledge, shall be sufficient.

TRANSFER FROM ONE CLASS TO ANOTHER

Candidates for transfer from one class to another shall be proposed and supported in the manner prescribed in Articles 19, 20 and 21 for election to the respective class to which the candidates are desirous of being transferred.

ENTRANCE FEES, ANNUAL SUBSCRIPTION AND LIFE COMPOSITIONS

The following entrance fees shall be paid :—

Members	...	...	Rs. 20/-
Associate Members	...	...	„ 10/-
Technical Corporate Members	...	•	„ Nil

Associates	...	...	Rs. 10/-
Graduates	...	...	„ 5/-
Students	...	...	„ 2/-

Provided that—

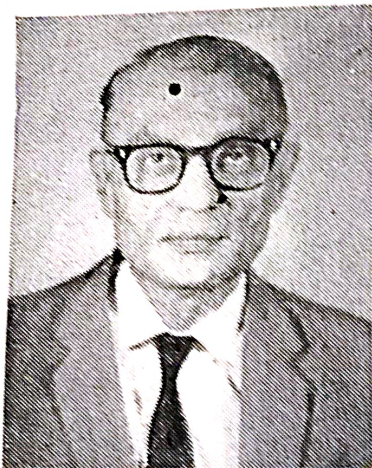
(a) Persons transferred to another class shall pay an amount equal to the entrance fee of the class to which they have been transferred after deducting therefrom any entrance fee or fees previously paid by them ;

(b) Students who have paid not less than three annual subscriptions as students shall pay on transfer to the class of Associate Member an entrance fee of Rupees 5.

Persons or organisation who have not compounded shall pay the following annual subscriptions :—

Members	...	...	Rs. 30/-
Associate Members	...	...	„ 15/-
Technical Corporate Members	...	...	„ 200/-
Associates	...	...	„ 15/-
Graduates	...	...	„ 10/-
Students	...	...	„ 6/-

When any member of any class who has not compounded is transferred to another class, he shall pay the same annual subscription as if he had been elected to such other class on the day on which he was transferred thereto.

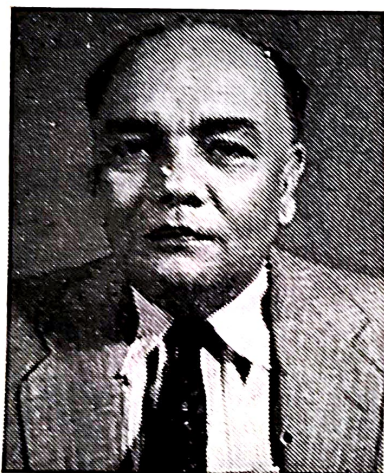


Sri P. C. Bose,
Chairman.

GOLDEN JUBILEE ADVISORY BOARD



Sri S. Bandopadhyay,
Reception.



Sri A. K. Sen,
Entertainment.



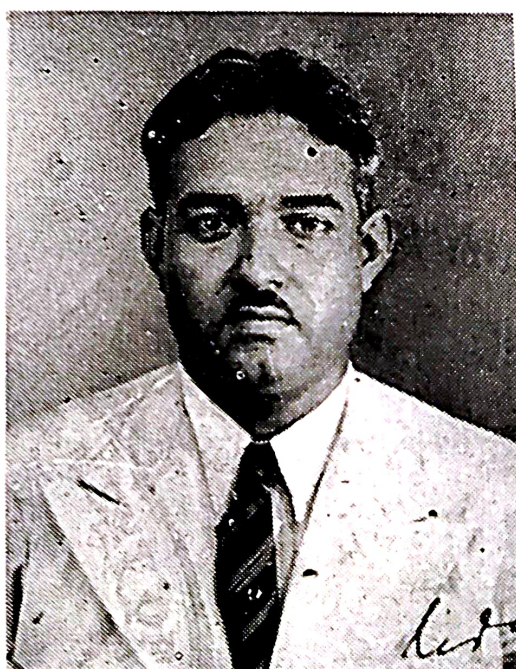
Sri H. Kothari,
Public Relations.



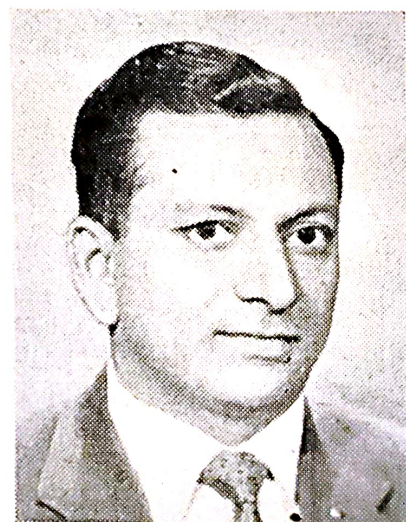
Sri D. S. Desai,
Finance.



Sri B. N. Banerjee,
Publications.



Sri S. Chatterjee,
Administration.
& OTHERS

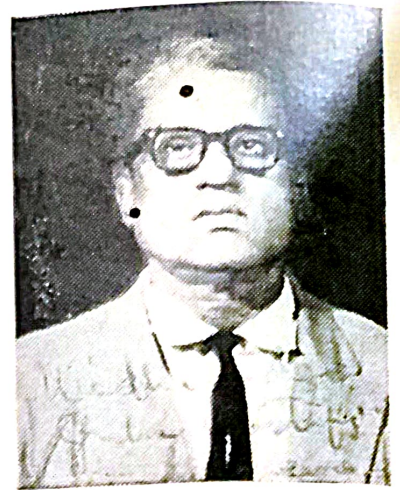


Sri R. B. Gimi,
Publicity.



Sri H. N. Chakraverty,
Council-Member.

GOLDEN JUBILEE CAMP



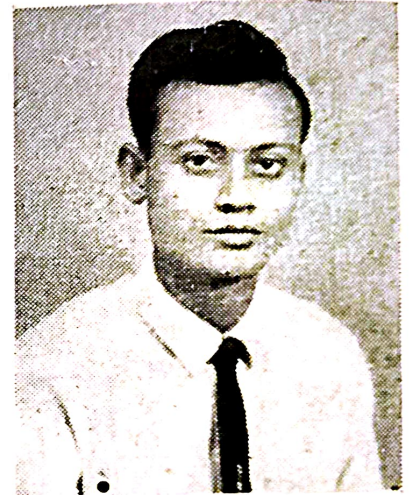
Sri M. S. Guha Mustafi,
Asst. Secretary.



Sri D. M. Dey,
Employment Information.



Sri A. K. Bhunia,
Seminar.



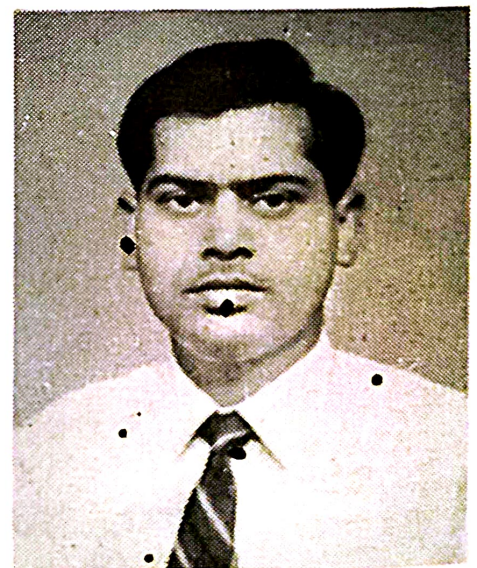
Sri M. N. Ghosh,
Finance.



Sri T. K. Basu,
Reception.



Sri P. C. Roy,
Council-Member.



Sri K. C. Saxena,
Asst. Secretary.

TO THE FUTURE ARCHITECTS OF INDIA*

K. N. Mookerjee, M. Sc.

Chairman, Finance Corporation

I am conscious, I am speaking today, mostly of young engineers or would be engineers. These young men in particular have a lot to complain about. After all, they have taken time and expensive training and education. If they have to move from door to door in search of job like another unemployed, then surely there is something wrong with our economy and society at large. Engineers after all, are the main instruments of industrial progress. In fact, we cannot conceive of an industrial society without engineers.

Engineers had to play a vital role in managing and co-ordinating big industrial complexes that were growing over the country. Humankind at various stages of its evolution had been led by philosophers, economists and scientists. But modern times, belong to engineers, who will have to lead to a greater progress.

Bearing these facts in mind, I feel distressed that thousands of our young engineers have remained unemployed. It is really a great national tragedy. These young men went to engineering colleges and institutions in the great hope that they would find a worthwhile career after completing their education; also the various plans and blue-prints and projects run by the Government led to such expectations, being raised in the minds of our young men. The failure of our country's planning coupled with two worse and severe drought in the recent past have completely upset our

economic balance, bringing in its strains, stagnation and finally recession, in many vital sectors of the economy. This is the major reason for all our difficulties today, including the unemployment problem amongst the educated youth in the country.

But, having created the mess, we must clear it. When I say, we, I do not mean the government although the government has to play the major role, but all of us, people in every walk of life including the young engineers. Now, one may ask, what one can do to help in the solution of the various national economic problems. In answering this question everybody should find ways of helping himself, since large scale unemployment among the engineers is a major problem for the national economy.

The best way of helping oneself is by finding avenues of self-employment through industries or business ventures. It is no use merely sitting back and asking the government to find jobs for you.

"Tap the talent" is the need of the hour. Young engineers coming out of the colleges need proper guidance. At present we are faced with the problem of finding employment of engineers whose numbers are still between 30,000 to 40,000. The crash programme initiated by the government for unemployed engineers is not likely to provide jobs for more than 3,000 in the Public Sector for the time being. Every year 25,000 engineers and 50,000

* Extract from a speech.

diploma-holders would come out of the colleges according to present admission capacity in the country. Can we create enough jobs in Government and other bodies to absorb all the engineers? My answer to it will be 'no'. There was a proposal that every industry should employ $\frac{2}{3}$ additional engineers for every crore of production. This may absorb some unemployed engineers for the present. But they will be an additional load for which real jobs do not exist.

According to me, the permanent solution of the problem lies in the engineers becoming self-employed. They should start small and medium industries either individually or collectively.

I have often given thoughts to the problems of engineers' employment and I am convinced that if some of them had tried seriously, they could find opportunity of self-employment in our developing economy. They can start small business ventures and industries. If they can think of and plan a sound project, then finance should not be a problem to them. The credit pattern of financial institutions all over the country including the West Bengal is being re-oriented to the objective of providing more financial assistance to young technicians and engineers specially those who have good technical know-how, but are unable to start an industry on their own and are also unable to furnish any security against financial assistance, are now being encouraged through a number of special schemes.

I am also aware that financial assistance to qualified engineers may not be enough in all cases. First of all, they need some idea of how an industry or business enterprise is to be run. I feel, there must be an effective training programme for all those young engineers who wish to start such ventures with financial assistance from the State. Well-planned courses of training for a period of at least six months should be available to such aspiring entrepreneurs

with proper theoretical instructions in factory layout, production planning, marketing and so on.

The creation of an Industrial Assistance Cell—a central agency is very much necessary to assist the entrepreneurs regarding establishment of new industries or difficulties faced by them in the existing industries. It can also disseminate information on procedural formalities, availability of infra-structure facilities or other relevant factors.

While the central agency would guide the young entrepreneurs to locate industries suitable in particular area where there is demand for the unit, they should also be encouraged with other concessions like lower rent for the use and occupation of land and building in Industrial Estates, reduction in electricity charges, exemption of sales tax for a certain period and various other facilities as offered by other States to attract the entrepreneurs. The concessions offered will have long range benefit at the cost of immediate reduction in earning and there should be good appeal from the government side to young entrepreneurs as is being done by other States.

Larger flow of funds is also necessary so that young entrepreneurs do not feel handicapped. There are different agencies for such help and I feel here also a central agency is necessary who can take up the cause of entrepreneurs in getting all legitimate requirements of industries covering all stages of production from the stage of purchase of raw materials to the stage of realisation of bills representing the despatch of finished goods. Perhaps the practice obtaining in other countries particularly in Japan is worth emulating.

There are three types of entrepreneurs who go in for Industry: Technician entrepreneurs, dealer entrepreneurs and financial entrepreneurs. Technical entrepreneurs know their job well and can face all the vicissitudes of fortune with adjustments in times of necessity; the

dealer entrepreneur has the command over the market having traded on the items he ultimately resorts to manufacture with notional idea of such techniques. The financial entrepreneur is just to hire technicians to achieve his end. Our experience with the first two groups have been very good having seen their performances.

For young Engineers and Technicians who are leaving university and colleges with degrees in their pockets, with future bleak and dark, as regards prospects for employment, a humble advise will be to start any business however small it may be. I have frequently thought over a puzzling problem and never got the correct answer. How is it that the youths of Bengal who gallantly fought and won political freedom are today lagging behind in the fight for economic freedom? They are not lacking in courage and dash in undertaking risk. They braved the bullets and faced bayonets of a colonial power. How is it they are in the background now? For business one needs hard labour, perseverance, courage to undertake risk. All these are in abundance in our youths. The only conclusion that I draw is that all their efforts are being channalised in a wrong direction. A little orientation will put them on the right path and solve their problem. The people of Madras were considered as backward in business and fit for only white coloured jobs but they have exploded the myth—youths of Bengal can do the same.

Since 1958 only one country with a per capita income of Rs. 5,500/- or more had undergone violent upheaval whereas 87% of the countries with a per capita income of less than Rs. 750/- had suffered an average of two major outbreaks of violence per country. Therefore, it is clear that at the root of students unrest or political instability lies economic deficiencies.

We have obtained political freedom but the economic freedom is not yet in sight. We are fighting for it. But as in all fights, let the

students community come in the forefront. By fight, I do not mean processions, demonstrations, gherrao or violence in any form. I mean constructive work; let them come forward and extend a helping hand; work more, produce more, start new industry and trade, solve their own unemployment problem and create jobs for others. This is a herculean job.

'All things seem hard to man that are above his attained level and they are hard to his unaided efforts but they become at once easy and simple when God in man takes up the challenge.'

The U. S. Under-Secretary of State had once said "Can we graduate fast enough from the revolution of rising expectation to the evolution of rising responsibility". This is the challenge before our youths.

The economic crisis that we are facing at the present moment is primarily due to the fact that we have not been able to put the young-man in its proper place. I am reminded of a story of a man who was looking at a map of the world. He got disgusted with so many countries and people fighting with each other and disturbing peace of the world. He tore the map into pieces in utter disgust. At that moment his little son appeared and he handed over these pieces of papers to his son and told him 'Sonny, can you put this map of the world in order. If you can do that I will take you to the picture to-night'. He knew that his son would not be able to do it. But he was surprised when after ten minutes his son came back with perfect map in his hand. On further enquiry how he could do it, the son replied "Dady, it is simple; there was a picture of a man on the back of the map and I put the man in its proper place". This is precisely the problem before us.

I had visited Japan many times. I saw Japan immediately after war. People were walking in the streets of Tokyo. Then I saw these people using cycles and then scooters and

motorcycle and now automobiles. This fantastic progress has been made possible within a span of 15 years. So, I asked some of my Japanese friends how this has been made possible and what was the secret of it. My friends replied that only through hard labour.

I had visited West Germany. I had seen Germany immediately after war and I have seen it now with all its prosperity. Such fantastic progress was made possible only within

a period of 10 years. I had asked some of my West German friends about the secret of their success. They said that bombing had destroyed their cities, their ports, their factories but it could not destroy their national character. Therefore, two things are necessary for progress and prosperity—one is hard labour and the other is strong national character. Unless we have these two things it is futile to expect an economic miracle in our country.

The Golden Jubilee

(AN ACROSTIC)

SADANANDA MOHANTY

This then is our golden-jubilee year
How unique has been the achievement here.
Engineers of the Country let all unite
Give your heart and join your hands for a fight.
On us brothers lies the future of our country
Let us march on to forge our history.
Daring sons of our land are we
Endless structures we've built as you see.
Never in history such a critical time we had to face
Jobless engineers when are roving all over the place.
Unto the last we must strive to seek
Better means to live, to see our future no longer bleak
In and around the globe has risen a tide
Let us on the crests of waves with valour ride.
Engineers' Association may grow stronger day by day
Ever united we stay let us now promise & pray.

Water Supply Problem of Metropolitan Calcutta & Master Plan Recommendation for its Solution

By

S. Chatterjee, M.A. Sc. (Toronto), B. Sc., B.E., C.E., F.I. Struct. E., M.I.E. (Ind),

M. Mech. E.A., M.A.S.,

Chief Engineer, C.M.P.O., Calcutta.

1. INTRODUCTION :

Calcutta with its surrounding region was one of the endemic foci of Cholera for a pretty long time. This disease abruptly erupts especially during the summer, spreads with strange alacrity and plays havoc with human lives. Insanitary environmental condition and the deterioration of quality and quantity of drinking water accelerate epidemicity and endemicity of asiatic Cholera and other water-borne diseases. In 1884 Dr. Robert Koch had to come from Berlin down to Calcutta (at the invitation of British Government) to investigate into and find out etiological agent for the cause of Cholera. He went even upto Jessore where the scourge of mortality rate from Cholera was then abnormally high. Fortunately, he was able after culture to isolate under his microscope the germ of Cholera-comma bacilli, i.e Cholera vibrio from the stool of the cholera infected person. His hypothesis stood the test of time.

After the incidence of epidemic cholera of 1958 in Calcutta Govt. was able to make WHO interested in the study for eradication of cholera from this area which remained an endemic focus of spread of this disease throughout the world. WHO Team under the leadership of Prof. Abel Wolman made an interim recommendation in early part of 1960.

On the recommendation of WHO Expert

Team WHO set up a Consulting Engineering Consortium to examine the problem and to prepare a Master Plan for Water Supply, Sewerage and Drainage of Metropolitan Calcutta supported by a team of Indian Engineers. They framed status report for water supply, sewerage & drainage condition of Metropolitan Calcutta at the very outset.

In order to plan for more water in this vast area of Calcutta Metropolitan District, various complexities of problems are to be dealt with. It is necessary to determine the existing facilities, to assess the existing and future demands (domestic, industrial, fire, municipal and others) in stages and to devise ways and means to solve the problem by exploring more secured sources of water supply and extending the distribution system throughout the length and breadth of CMD for equitable distribution of protected water after treating the water properly.

2. LOCATION :

Calcutta Metropolitan District situated on the both sides of the river Bhagirathi (Hooghly) covers nearly 490 square miles and brings under its compass 3 Corporations (Calcutta, Howrah and Chandernagar), 33 Municipalities, 33 non-municipal urban areas, and considerable extent of adjacent rural fringes likely to be urbanised soon.

3. EXISTING FACILITIES :

The details of the existing facilities as to its sources of water supply, present treatment facilities, arrangement of transmission main and the major and minor distribution system, for conveyance of water to consumers' places its nature and capacities of storage facilities and pumping arrangements were determined which were found to be very inadequate.

Calcutta, Hooghly-Chinsura, Howrah, Serampore, Baranagar-Kamarhati and Uttarpara only receive water from the river Bhagirathi whereas the remaining municipalities take recourse to underground source of water supply. In emergency water supply scheme all municipal areas within CMD is provided with protected water supply. Works for the non-municipal urban areas are in progress for piped water supply.

4. WATER DEMAND :

Domestic Demand

In order to assess the domestic demand for Calcutta Metropolitan District (CMD) is divided into two categories of consumers for domestic purpose :

- i) Group I : Occupiers of holdings having a variety of plumbing fixtures. This group will consume 50 gpcd (60 gpcd for Calcutta and Howrah).
- ii) Group II : Occupiers of dwelling containing a minimum number of plumbing fixtures having one tap and latrine to each building and where the residents depend on community roadside water taps. They consume 20 gpcd on an average.

On the basis of the projected 1981 and 2001 population average daily domestic water demand has been framed by population zones

which comes to 411.57 mgd in 1981 and 753.82 mgd in 2001 A.D.

5. INDUSTRIAL REQUIREMENTS :

CMPO has classified the existing industries to the following four consolidated groups : (1) Engineering, (Metal Industries) (2) Chemical, (3) Jute and textile, (4) others and tentatively assessed their requirements. The industrial demand assessed as 231.0 mgd and 426.3 mgd in 1981 and 2001 respectively.

6. FIRE ALLOWANCES :

Fifty per cent of the total demand for fire services will be obtained from municipal supplies. The balance is obtained from tanks, ponds, khals and rivers. Fire supply will be available at the rate of 2,500 gpm to 500 gpm i. e. from highly industrial district to lesser residential areas simultaneously with maximum-day domestic demand plus average-day industrial demand at a minimum residual hydrant pressure of 20 psi.

7. DESIGN CRITERIA :

A. Pressure :

Minimum pressure at service connection = 20 psi.

Minimum pressure in primary distribution mains = 35 psi.

Maximum pressure in primary distribution mains = 90 psi.

B. Peak Flow :

Maximum day demand is taken as 1.25 of average day demand.

Maximum hourly demand has been adopted as 1.6 to 2.0 (mean value of 1.85) times of average day.

C. 'C' values adopted for different pipes in Hazen Formula :

For existing pipes for filtered and unfiltered

water having various diameter. 'C' value ranges between 50 to 90 depending upon the diameters of the conduits.

For new pipes—

24 inch diameter and above—130
(Assumed cement lined)

16 to 20 inch diameter—120 (Assumed cement lined)

Below 16" diameter—110 (not lined)

D. Design Period :

The following table will indicate the design period adopted for different components of water supply system.

Table

Sl. No.	Description	Period in years
1.	Land for Treatment Plant, Pumping Station, Reservoir.	40 or more
2.	Intake Jetty	40 or more
3.	Building & Pumping Station	40 or more
4.	Equipment with Pumping Station	15 or less
5.	Water Treatment Plant	15 or less
6.	Transmission line	15 to 20
7.	Primary Distribution System	15 to 20
8.	Secondary Distribution System	40 or more
9.	Ground Level Reservoir	15 to 20.

6. POPULATION :

The population of CMD is divided into 10 zones, having a total population of 6.537 millions in 1961. It is estimated that in 1981 it will be 9.879 millions and is expected to reach 14.788 millions during 2001 A.D. The population zonal division is an arbitrary one based primarily on study of—

(a) Industrial employment by different industrial categories ;

(b) Income generated in different sections of economy ;

(c) Present population density.

Four of the 10 zones are located on the western bank of Hooghly whereas 6 on the eastern side.

7. DETAILS OF WATER SUPPLY :

This subject can be elaborated in under different captions. The first of all comes source of water—supply within the CMD area, its treatment facilities both for surface and ground-water supplies, its transmission main from treatment site to distribution centre, its storage facilities, pumping stations and then the net work of distribution system from which water is conveyed to individual premises.

8. SOURCE :

There are three probable sources of water supply for C.M.D. The 'Bhagirathi', Damodar and Ajoy' and ground water. At present none of the sources are secured and dependable. The construction of Farrakka Barrage which will divert at least 20,000 cfs of headwater from the river Ganga into Bhagirathi during dry weather period is deemed as dependable source. The Damodar-Ajoy does not carry sufficient water during dry season to meet the need. The quality of ground water in southern half of C.M.D. is far from uniformly satisfactory having undesirable salinity and iron contents.

TREATMENT OF WATER :

As the source of water is from the river Hooghly, there is considerable pollution load from physical, chemical and bacterial point of view. The range of turbidity and salinity varies very widely. During summer there is serious problem of excessive salinity whereas in

the rainy season the problem of heavy turbidity occurs. The usual process of treatment is being applied and will be introduced by way of

- (1) Primary settling. (2) Flocculation-Coagulation. (3) Sedimentation. (4) Filtration (slow or rapid sand) (5) Disinfection (chlorination). & (6) Clear water storage.

CONVEYANCE OF WATER :

For better control and equitable distribution of water, eastern bank areas have been divided into three service districts : (i) Palta Service District (ii) Calcutta Service District and (iii) Garden Reach Service District.

On the western bank two service districts are contemplated, i.e. (i) Serampore Service District and (ii) Howrah Service District.

8. TOTAL WATER EXTRACTION

The following statement indicates the quantity of water supply from different waterworks during three different phases upto the end of this century.

Planned output of river water in 'mdg' during

indicated in the Master Plan Proposal including the provision of secondary distribution mains is indicated below.

Estimated cost in Rupees (in crores) for works in

	Interim Phase	Intermediate Phase	Ultimate Phase	Total
Cost in Rs. in crores.	11.872	81.665	61.024	154.561

The cost per capita will come to little over one hundred rupees per person. The ultimate figure will be reached sometime in 2001 A.D. i.e. after a course of more than thirty years. It calculates out to be little more than three rupees per year per person.

10. THREE PHASE PLANNING FOR EXECUTION :

During interim phase augmentation of water supply will be done through tubewells to sixteen municipal and fourteen non-municipal urban areas. This project comes within the purview of Emergency Water supply. The total estimated cost is Rs. 30.114 crores.

In Calcutta proper, interim phase works include improvement of transmission mains, improvement of Palta water works, strengthen-

Name of Waterworks	Interim Phase	Intermediate Phase	Ultimate Phase
Palta Waterworks	(88 + 18 + 60) = 166	(160 + 21) = 181	(160 + 121) = 281
Baranagar-Kamarhati			
Joint Waterworks	—	63	171
Garden Reach Waterworks	60	85	320
Serampore Waterworks	—	20	67
Howrah Waterworks	—	37	265
	226 mgd	386 mgd	1,104

9. COST ESTIMATE :

The estimated cost as presently framed in crores of Rupees for providing Emergency Water Supply and interim phase works, expansion of waterworks and the distribution system in intermediate and in ultimate phase works as

ing or pumping and storage facilities at Tala, introduction of booster pumping stations, introduction of clarified unfiltered water supply from Garden Reach, retirement of Mullic Ghat and Watgunge unfiltered water pumping stations, modification of unfiltered water lines, etc. Un-

fortunately municipalities other than Calcutta Corporation does not obtain any interim benefits.

INTERMEDIATE PHASE : (1971-1981 A.D)

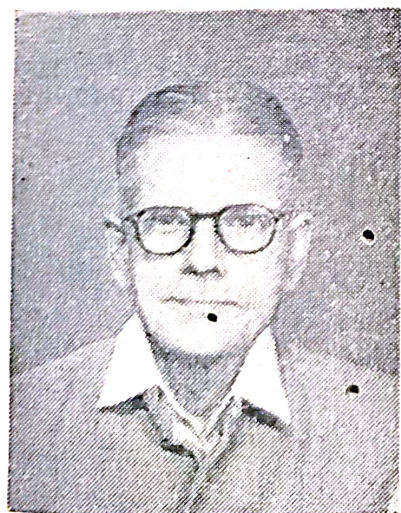
This phase includes addition to Palta Water Works, addition to filtered water primary grid in Calcutta Service District, the addition to two booster stations, partial operation of Garden Reach Water Works, addition to Baranagar Kamarhati Joint Water-works, construction of new Howrah Waterworks in Puddapukur Jala area, construction of Serampore waterworks at new site, augmentation of primary distribution grid and complete integration of northern portion of Calcutta unfiltered water distribution system with the filtered water distribution system.

ULTIMATE PHASE : (1981-2001 A.D.)

In this phase the following works will be taken up :

1. Further addition to Palta Waterworks.
2. " " Filtered water distribution facilities to Calcutta Service District.
3. To keep the ground water supply facilities of Calcutta as a standby.
4. Further addition to Garden Reach Waterworks.
5. Further addition to Baranagar Kamarhati Waterworks.
6. " " to Howrah Waterworks.
7. " " to Serampore Waterworks.
8. Addition to surface water primary distribution networks.
6. Complete integration of filtered and unfiltered water system of Calcutta Service District.

It is planned that the ground water sources of supply to different municipalities during Interim and Intermediate phase will be placed as standby during ultimate phase.



Pannalal Das

When our Association celebrates the Golden Jubilee, our Panna Babu celebrates his Silver Jubilee, not in years but in service to the Association. Secretaries have come and gone but our Panna Babu remains for ever. He is least pedantic but he is legitimately proud for not taking leave. He is a youngman of sixtyfive autumns and we wish him many more return of the seasons.

EMPLOYMENT OUTLOOK FOR ENGINEERS

By

SAROJAKSHA BASU, B.SC. (Glas), M.A.E., M.I.E.
President : The Association of Engineers.

The Association of Engineers has now completed fifty years of existence. It is now no longer young and may be said to be growing old. On the occasion of its Golden Jubilee it is now, as it were, rising out of a stupor of seeming stagnation to an enlivenment with new vigour under the influence of ardent enthusiasm of the rising generation of dedicated young engineers.

The problems we have before us are great. Uppermost in our minds is anxiety regarding the future career of the large number of unemployed youth, who have been educated and trained for service in the Engineering profession. How to find employment for them? It is no fault of the youth that they are not employed. It is not that they have not the requisite training, education and ability for any job. It is not correct to say that they have been trained for jobs and services that are not required here. There is a vast amount of work that is yet to be done for the welfare of the public and for which these trained youth are eminently suited. But it is by some misfortune that there is no authority to take these much wanted works on hand. The plans are in abeyance for want of funds. The funds themselves are not in the right hands. Something must be done to secure them in good time. It is to be hoped that the control that is likely to be obtained by Government through the Nationalisation of Banks will provide some solution to the problems that have arisen.

If we take a detailed look at the basic requirements of the population of this country we will find the amount of work and the employment possibilities in the need for production of :

- 1) Food with sufficient calories & proteins.
- 2) Drinking water and sanitary arrangements.
- 3) Clothing—for each individual for summer and winter.
- 4) Housing for each family.
- 5) Book for education of each student.
- 6) Buildings for schools.
- 7) Watersupply, sanitation & drainage for each community.
- 8) Hospitals for ailing folk.
- 9) Mills for flour & rice.
- 10) Factories for manufacture of tools, machinery, agricultural implements, tractors & vehicles for transport.
- 11) Fertilisers & factories, improvement of agricultural produce.
- 12) Sewage treatment plants for disposal of waste water.
- 13) Ship building yards for production of ships for transport of passengers, goods and for defence of our coasts.
- 14) Dry docks for repair of old craft.
- 15) Wet docks and harbours for shipment & discharge of goods.
- 16) Aircraft and landing & take off runways for Air traffic.

• 17) Radio, Telegraph, Telephone for communications.

18) Pharmaceutical works.

19) Technical Libraries, Technical Journals & Press.

20) Technical societies, civil, mechanical, electrical public health, telecommunication etc.

When we consider our basic daily needs, starting from the morning, as we wake to the time we go to bed we see the enormous amount of work and services we depend on :

1) The water for our ablutions before we begin our meals and the water we drink are supplied and purified by the Municipal engineers & Waterworks.

2) The food that we eat is provided by dairy workers, farmers, agriculturists, fishermen, food preservers and containers & container makers, Fertiliser Factory Workers, Designers, cooks, cooking ranges, stoves, coal & coal-miners.

3) For disposal of sewage and refuse we depend upon Municipal sanitary services, including scavengers, garbage removers, motor vehicle drivers, pumping machinery, workers, engineers & designers.

4) For our transport to and from one localities of employment, profession or business, we depend on transport workers, transport vehicles, their operators, drivers, manufacturers, and designers, locomotive, automo-

bile, ship, aircraft, designers, manufacturers, operators.

5) For our habitation we depend on the housebuilder, mason, brickfield worker, architect & contractor, furniture makers, dealers, designers, timber workers, joiners, plastic & board makers.

6) For our health we require, medicines, Vitamins, etc. produced by pharmaceutical works, surgical and dental tool manufacturers.

7) For our edification and knowledge we require, information by newspapers, magazines, books and radio, involving work for writers, printers artists, paper makers, printing-press workers, Blockmakers, book binders, dealers & distributors, radio manufacturers, printer, press designers and manufacturers.

Without further enlarging the best of our numerous requirements, it is apparent from just these few items what a large amount of employment possibility there is for engineering workers and how much this increases with increasing population, if every body's requirement is to be met. It is to meet the needs of each and every body, not only in the cities but in the rural areas also, that our efforts and our planning must now be directed. With proper planning of priorities in the placement of orders and expenditure of funds the solution to the problem of suitable employment—for our educated and trained youth will be found.

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CIVIL ENGINEERING DESIGNS BY MAN COMPUTER DIALOGUE

By .

* PRADYOT NIYOGI, Ph. D.
Associate Member

Introduction

During the past several years, there has been tremendous advancement in the technology of high speed digital computers. The capabilities of these giant machines are being used for a variety of services other than mere computational work. One of the comparatively recent developments that has immense potential for applications is what is commonly known as 'Computer Graphics'.

In a broad sense, 'Computer Graphics' means drawing of pictures by means of computers. This includes automatic drafting, computer generated movies, animated cartoons, input-output display on cathode ray tube, and so on. This last feature has attracted the interest of scientists and engineers, who believe that within a few years, a major part of the total computer time will be expended for graphical display. In this paper, the term 'computer graphics' is used in the limited sense of such cathode ray tube I/O displays.

There has already been quite a few applications of computer graphics in design engineering particularly in the aero-space industry for simulation of dynamic behaviour of systems. It is possible to use the same techniques to set up a general civil engineering design system.

Background

Digital computers are widely being used in

design engineering all over the world in recent years. Basic procedure of engineering design is to choose certain parameters of the system under study and after looking at the response, to alter them for possible optimisation of the final design. These steps are identical for structural systems, traffic systems, water or sewer systems, and possibly other branches of civil engineering. This method of repetitive iteration can very efficiently be performed by modern digital computers at a tremendously fast rate, producing error-free results.

In spite of such possible high speed and accuracy of computeraided methods, optimisation of engineering systems is hardly attempted in design offices. On the successful completion of an analysis of a system by computer, the design engineer obtains a print out of several thousand lines. Although time is saved in executing this process, since the computations are made by machine, the designer does not get any feeling about the behaviour of the system unless he actually goes through those thousands of printed lines in details. Consequently, in practice, the engineer tries only a few iterations by altering the design parameters manually to obtain the final design. The immense capabilities of the machine remain unused. On the other hand, engineers accustomed to looking at the input data and the final results only, usually take more time to learn the behaviour of systems than he would take if this was done by hand-computation. This again sometimes leads to serious mistakes due to errors in the input

* Asstt. Professor of Civil Engineering, Sacramento State College, Sacramento, California, Formerly Post-Doctoral Research Fellow, University of Pennsylvania, Philadelphia, Pennsylvania, U.S.A.

data, which an inexperienced designer may not be able to discover by looking at the printed output.

The drawbacks of computer-aided design methods can be eliminated and at the same time the advantages of high speed and accuracy can be attained if there is a method of direct man-machines communication with the capability of displaying the input and output in a convenient form. This can be achieved, with the present state of the art, by proper use of computer graphics, the display system being equipped for direct conversational mode of operation.

Using this set up, the designer can have a visual presentation of the system under study, generated from input data. If there is any error in the input, it can be recognized instantly. Any response of the system that can be formulated mathematically, can be superimposed on the display. Any component of the system can be altered eliminated or added by means of the conversational mode of operation and the modified response of the system be displayed. The whole operation is fast, quick and effortless.

Computer graphical techniques gives two important services to the design engineers :

(1) The designer is able to vary the parameters of the system under study almost indefinitely, and thus, by trial, he is able to select an optimal system, which may depend on so many different factors like aesthetics, interference with other systems, capacity, convenience, etc.

(2) Since the engineer actually visualizes how the systems behave under different conditions and with different combinations of the design parameters, he becomes greatly experienced in a short time. Intuitions or judgement based on experience, thus plays an important role in the design process. This is a very significant factor because most engineering designs require the values of certain parameters of the system be assumed and the more correct these

assumptions are, the faster and economic is the design.

A research programme has been conducted by the author at the department of Civil Engineering, University of Pennsylvania, for studying the possible application of computer graphics to a general civil engineering design system. It has been established that such a unified computer graphical programme for general civil engineering design (including structural mechanics, transportation engineering, water resources engineering etc.) is perfectly feasible. In fact, this research work included actual solutions of simple design problems in structural mechanics and transportation engineering. The work is being continued with an aim to perform full-scale designs within the coming year.

General Approach.

The complete process of analysis, design, optimization and I/O display of a system can be performed in eight systematic steps, each of which is essentially a programming routines. These eight routines are :

(1) Analysis Routine : for mathematical analysis of the system under consideration.

(2) Member Properties : for computing the member properties required in the computations from the input data.

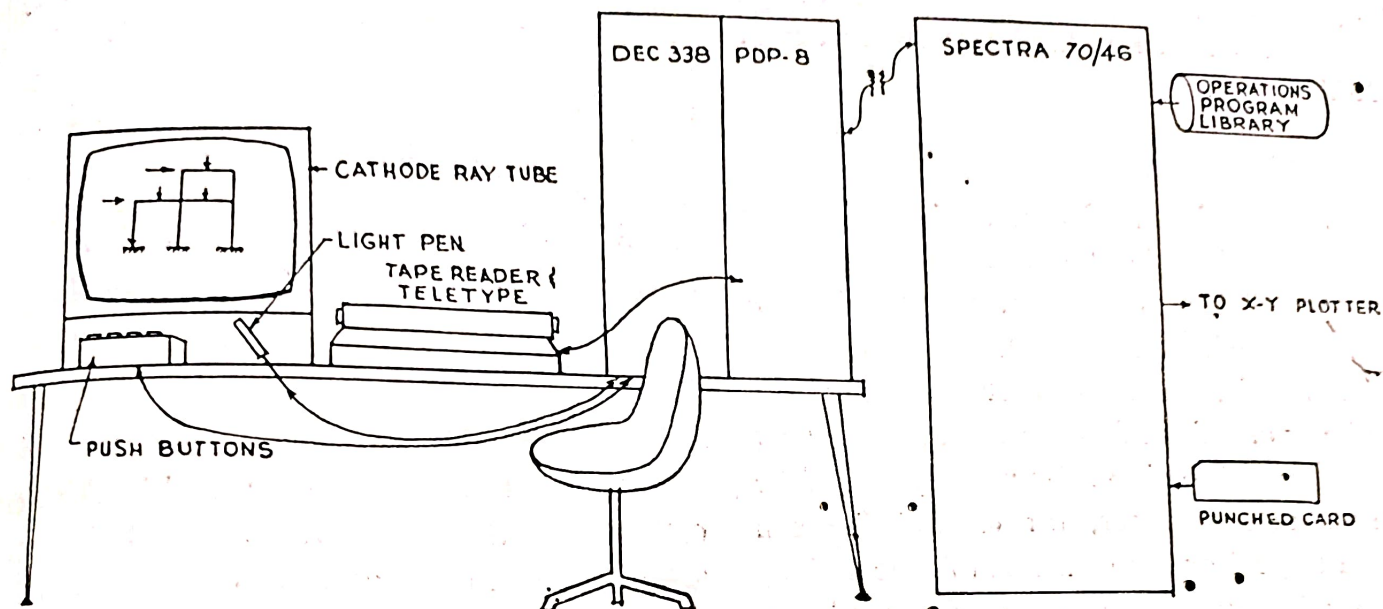
(3) Member Design : Programme for design of members in the system on the basis of the result of analysis, satisfying the requirements of the code of practice.

(4) Iteration Routine : This programme takes the member properties from the latest design and feed them as the new input.

(5) Optimization Routine : The quantity to be optimised (weight, cost, etc) is computed after each iteration, stored and compared to pick up the optimal design. (Optimisation

here means minimization of cost, weight etc. and is not used in the strict sense of the term).

incorporate the different branches in a unified computer graphical system.



(6) On-line Access : This enables the designer to alter any parameter of the design directly by means of teletype or light pen.

(7) Input Data : This may be in the form of punched card, punched tape or be typed on a teletype.

(8) General Programme : Programme for input and output (I/O) display.

It has already been mentioned that the operations in the design of the different branches of Civil Engineering systems are almost identical. This enables an engineer to

General Operation System :

The eight essential steps of the design process are performed in a unified General Operation System. The system is schematically shown in Figure. It basically consists of a PDP-8 computer with DEC-338 display device with input-output devices like teletype, cathode ray tube, lightpen, pushbutton. etc. and as RCA Spectra 70/46 computer with X-Y plotter. For very small systems, the small computer PDP-8 may be adequate.

Input through punched card is processed by Spectra 70/46 and the output is sent to DEC 338 via PDP-8, which in turn displays them on

the cathode ray tube. Light pen, pushbuttons and teletypes are used for modification in input or output and for instructing the machine during conversational operation.

The design routines are kept in the library for operation programme. The final design can be obtained as a hard-copy by means of the X-Y plotter.

Conclusion :

It is the opinion of experts that computer graphics may just be the beginning of a new generation of design engineering and with the results obtained, the another is inclined to believe so. With the present stage-of-the art, the designer can sit in front of a graphic display console and feed the input by a teletype. If he is a structural engineer, for example he can display a large 2 or 3 dimensional frame and by the flip of a switch, he can superimpose bending moment, or shear force diagrams. He can alter the geometry, arrangement of members,

members properties ; he can add or delete any member or joint, he can change the loading, blow up any particular part of the frame by zooming, and so on. All these operations are fast, smooth and silent.

In the future, all design engineers may be working on computer graphical systems in design offices. A central computer may serve a number of offices, and the cost of equipments need not be too high, if produced in mass scale. Even in class rooms, this will be an excellent medium of instruction. Man and machine, working together in a graphical dialogue, will increase the efficiency of man to a great magnitude.

Acknowledgement

The work has been supported by Air Force Office of Scientific Research, Information Sciences Directorate and Transportation Studies Center of the Center for Urban Research and Experiment, University of Pennsylvania, Philadelphia, Pennsylvania.

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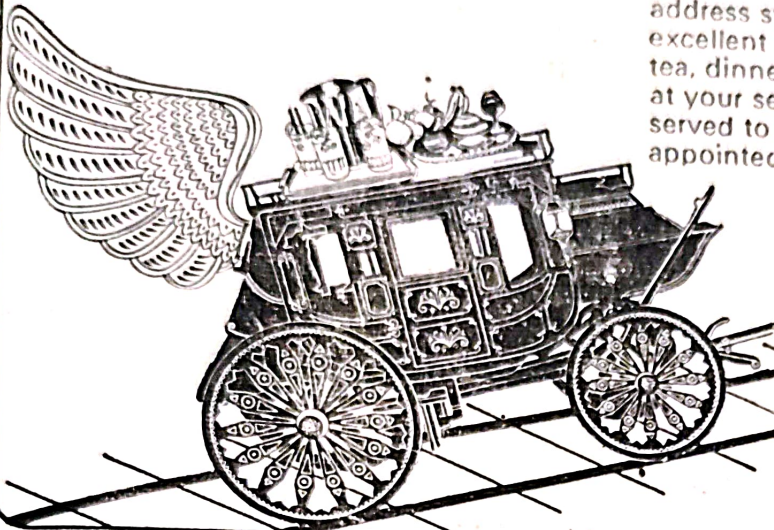
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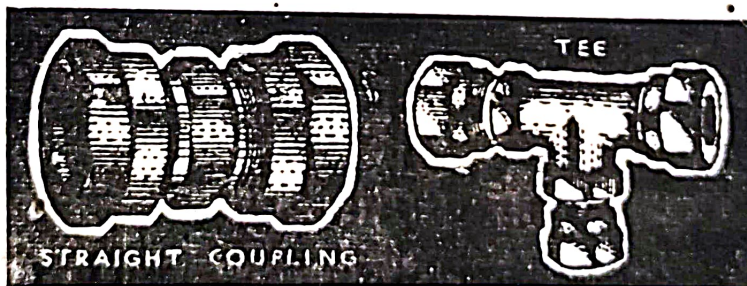
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SANITATION STATUS IN CALCUTTA METROPOLITAN DISTRICT

By

A. K. BHUNIA, B.E. (Cal), M. E. (P.H.), M.I.W.W.A, AMAE,
and

G. P. AGARWALA, B.C.E, M.E, (P.H.)

1. Introduction

The vast and complex array of problems are not only engulfing the city proper but also the Metropolitan District. Calcutta Metropolitan District (CMD) covers an area of about 490 square miles (Figure-1) stretching north south over a length of 50 miles along the river Ganges. Amongst its very many problems 'Santination' caused a stir not only within this country but also it raised a furore in the whole of the world. The reason being CMD was considered to be the nucleus of endemic cholera. In view of that a W. H. O. Consultant Team headed by Prof. Wolman made series of recommendations for the improvement of environmental sanitary conditions of CMD. Accordingly a Master Plan for Water Supply, Sewerage and Drainage was drawn up for CMD and presented under W. H. O. Project India-170 in 1967.

Santination though covers a very wide field, the discussion in this paper is kept limited to the collection and disposal of human excreta only.

2. Existing Facilities

Within the C. M. D., sewerage systems are in operation in Kalyani, Bhatpara, Titagarh, Calcutta and Serampore. Sewerage works are under construction in Dum Dum and Manicktala. In addition to the above there are a number of tiny sewerage networks and disposal facilities serving private organisations, industrial and housing developments, institutions and factories which are really insignificant in rela-

tion to overall need. All the sewerage systems are skeleton in nature excepting those in Kalyani and Calcutta. Even in the city of Calcutta there are considerable number of unsewered pockets wherein about 40,000 service privies still exist. In the remaining municipalities and urban areas service privies are in existence (Table-I) and human excreta are collected manually with the help of buckets, carts, tankers, trailers etc. and are disposed off mainly by trenching and composting.

Table—I

List of Municipalities Figure—I with Nos. of Existing Service Privies and the Annual Expenditure Incurred.

Name of Area	No. of Service Privies	Annual Expenditure in rupees
EAST BANK		
<i>Municipalities</i>		
1, Kanchrapara	2815	64,996
2, Halisahar	1114	54,504
3, Naihati	3367	1,25,280
4, Bhatpara	5161	2,59,568
5, Garulia	1066	48,720
6, North Barrackpur	3140	74, 82
7, Barrackpore	1978	83,280
8, Titagarh	1300	1,15,871
9, Khardah	1355	22,500
10, Panihati	2235	45,600
11, Kamarhati	3805	1,38,000
12, Baranagar	4341	1,55,700
13, North Dum Dum	169	8,584
14, Dum Dum	820	30,000
15, South Dum Dum	3850	70,704
16, Rajpur	718	17,052
17, South Suburban	3063	1,32,400
18, Garden Reach	5200	1,66,380
19, Budge Budge	1265	94,500
20, Barasat	492	50,000
21, Baruipur	400	16,397
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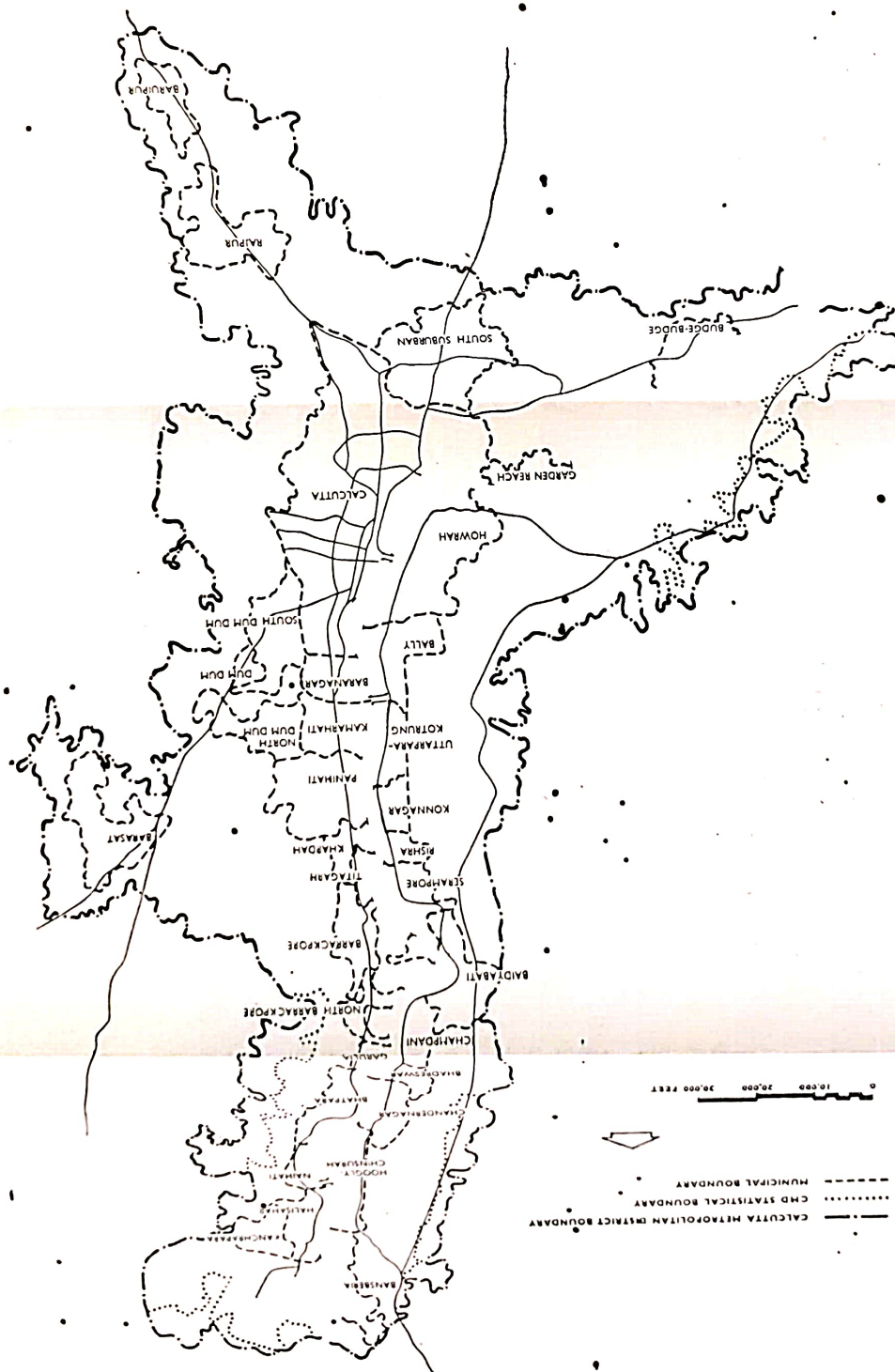
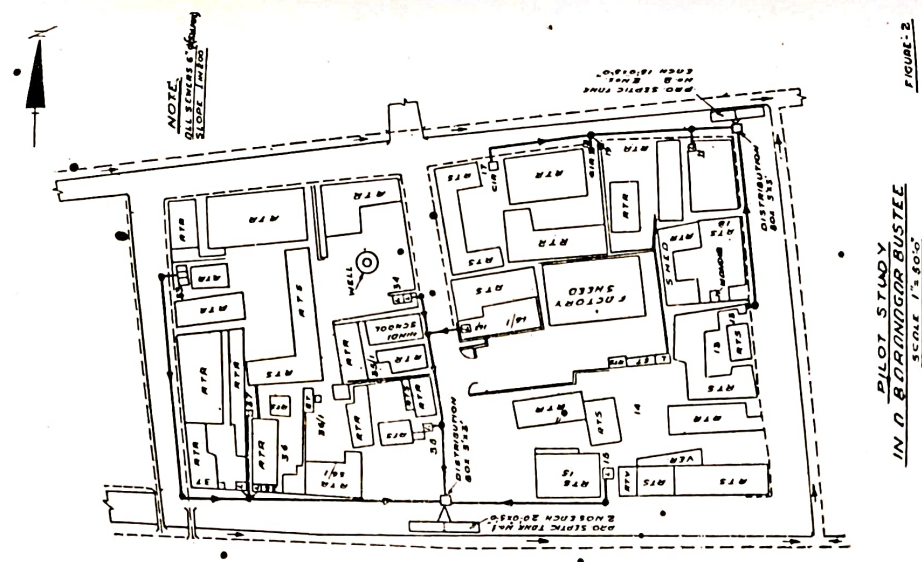


Fig. 1 CALCUTTA METROPOLITAN DISTRICT



PILOT STUDY
IN D. B. BORINGOR BUSTEE
SCALE 1" = 50'-0"

Table—I (Contd.)

Name of Area	No. of Service Privies	Annual Expenditure in rupees
WEST BANK		
<i>Municipalities</i>		
1. Howrah	23,512	12,53,600
2. Bally	3,676	2,25,000
3. Uttarpara	2,240	44,355
4. Kotrung	1,004	61,700
5. Rishra	1,110	65,798
6. Serampore	7,523	1,84,212
7. Konnagar	1,840	74,000
8. Baidyabati	3,300	64,800
9. Champdani	1,320	59,088
10. Bhadreswar	1,850	53,979
11. Chandernagar Corpn,	5,407	1,05,600
12. Hooghly-Chinsurah	7,978	1,64,400
13. Bansberia	1,645	42,408
	62,205	23,98,940

The remaining 16,580 nos. of service privies are scattered over the different non-municipal urban areas in the entire Metropolitan District.

3. Need for Improvements :

The prevalent practice of handling and disposing of night soil is not only unhygienic but undesirable too from aesthetic and humanitarian point of view.

This is an unique source for the spread of communicable diseases like cholera, diarrhoea, dysentery, gastroenteritis, typhoid, round worm and jaundies etc. Thus effective and proper disposal of human excreta is essential for promoting environmental sanitation so as to prevent infections transmitted through water, soil and flies. In addition, this prevalent system runs the risk of occasional collapse caused by labour unrest and interrupted service of the sweepers and scavengers.

4. Proposed Scheme :

Sewering the entire district definitely is a wholesome and permanent solution. This involves not only a large capital outlay but also

the execution will take quite a number of years for the funds to be available. Moreover, the National Committee for the Gandhi Centenary Celebrations has called upon all local authorities and State Governments to launch a vigorous campaign for the eradication of the evils of service latrines throughout the country by 2nd October, 1969.

In view of that schemes are to be drawn up for "Conversion of Service Privy into Sanitary Latrine" as an interim measure, pending implementation of the complete sewerage scheme.

The scheme envisages construction of centrally located septic tanks (Figure 2) to which the converted sanitary latrines will be connected. Two chambered tanks are recommended with the idea of using one compartment while cleaning the other. The septic tank effluents need further treatment. Seepage or soak pits are proved to be a failure at places when the water table is high. Dispersion although is a preferable solution but is handicapped by scarcity. As such septic tanks are located very near to the municipal drains and to avoid land acquisition difficulties, septic tanks are located under the municipal roads.

5. Design Criteria :

Av. ambient temp	... 25°C
Cleaning interval	... 1 year
Sedimentation capacity	... 4.4 sft/g p.m.
Percapita volume of fresh and digested sludge	... 0.019 cft/day
Digestion Period	... 63 days.
Per capita volume of digested sludge	... 0.00735 cft/day
Inlet and outlet	... 6" submerged tee.
Slope of Septic tank floor	... Minimum 10%
Sewer Size	... 6" dia minimum
Slope of sewer	... 1 in 200 minimum.

6. Cost Estimate :

Cost figures given here have been arrived at from the pilot study over a bustee area of 2,0 acres (Figure-2). Cost includes (i) Conversion of service privy into sanitary latrine, (ii) Construction of septic tanks for treatment of human excreta and (iii) Laying of sewer for conveyance of the waste to septic tanks.

Total cost/acre

Rs. 14,700/-

Per capita cost

Rs. 73.50

In this bustee the population density is around 200 persons per acre. Usual population density in the old bustees varies from 300-400 persons per acre. In that case the per capita cost would automatically come down.

The facilities at least cost half the cost of complete sewerage works, if not less.

7. Conclusion :

The authors do not claim any originality in this paper. The idea is to furnish before the readers a picture of sanitation standard in the biggest city of this country. Suggestions are also made for effluent and disposal of human excreta. This semi-permanent method is welcoming especially from the point of view of economy. The cost is at least 50% less than the complete sewerage works. The maintenance cost is very very low compared to any method of sewage or night soil treatment.

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Calcutta-31.

C

9. Chatterjee, Shyam Sunder,
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D

13. Das, Chitta Ranjan,
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K

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T

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V

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Galighar, Hooghly. • •
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Durgapur-4, Burdwan.
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cal Engineer's Drawing Office,
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Aparba Mitra Road; Calcutta-26.

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393/2, G. T. Road (South). P. O. Botanic Garden, Howrah.

59. Chowdhury, Santosh Kumar,
Building Inspector, Calcutta Corporation, Calcutta-13.

D

60. Das, Binoy Krishna,
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61. Das, Narendra Kumar,
77, Salimpur Lane, Dhankuria,
Calcutta-31.

62. Das, Dwijendra Nath,
6, Vasia Avenue, P. O. Chittaranjan,
Burdwan.

63. Das, Rabindra Nath,
61-C, Lansdowne Road, Calcutta-26.

64. Das, Mani Lal,
6, Jogipara Road, Satgachi:
Dum Dum; Calcutta-28.

65. Das, Surendra Nath,
240, Fatehpur 2nd Lane, Garden Reach, Calcutta-24.

66. Das, Susil Kumar,
Block 'G' (Flat 7) 60/61, B. T. Road,
Calcutta-2.

67. Datta, Dharendra Nath,
15, Rammoy Road, Calcutta-25.

68. Datta, Pramode Chandra,
1, Aswini Dutta Road, Calcutta-28.

69. Datta, Sailesh Chandra,
'Homesdale', P. O. Ghatsila,
Singhbhum, Bihar.

70. Deb, Amulyadhan,
Flat—D—5 West
20/1, Aswini Dutta Road,
Calcutta-54.

71. Deb, Jagadish Chandra,
171, Unique Park, Calcutta-34.

72. Deb, Ajit Kumar,
P. O. Kusunda, Dt. Dhanbad,
Bihar.

73. Das Gupta, Bidhu Bhusan,
8/53/1, Fern Road, Calcutta-19.

74. Das Gupta, Hemendra Bhusan:
235/A/6: S. K. Deb Road:
Calcutta-48.

75. Das Gupta, Susil Chandra:
83: S. N. Roy Road: Calcutta-30.

76. Das Gupta, Karuna Kumar,
Kali Park, P. O. Rajarhat-Gopalpur, 24, Parganas.

77. Das Gupta, Snehamoy,
16/1, Nakuleswar Bhattacharjee Lane; Calcutta-26.

78. Desai, D. S.
P-17; Mission Row Extn., Calcutta-1.

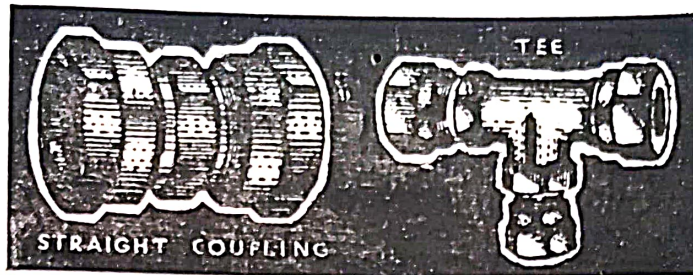
79. Dey, Amulya Charan,
102/A, Asutosh Mukherjee Road,
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Died 15th Jan. 1947
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5. Satyamoy Banerjee Majar
6. Pravat Kumar Banerjee
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 • 260 J. N. Dasgupta
 261 B. B. Mukherjee
 262 K. K. Banerjee
 263 H. C. Saha
 264 J. N. Kar
 265 B. Bose
 266 K. C. Goswami
 • 267 D. K. Kusarye
 268 A. K. Aditya
 269 Hazi Syed Jafar
 270 S. N. Paul
 271 Haridas Mukherjee
 272 K. K. Rohatgi
 273 Amar Nath Das
 274 R. P. Burman
 275 S. C. Sen
 976 N. B. Kurki
 277 P. S. Roy Chowdhury
 278 Hem Chandra Das Gupta
 279 H. B. Das Gupta
 280 S. P. Malaviya
 281 B. Sutradur
 282 S. N. Bose
 283 B. B. Das Gupta
 284 K. C. Gupta
 285 S. K. Ganguly
 286 P. G. Sinha
 287 M. N. Samanta
 288 G. C. Chatterjee
 289 A. Rahman
 290 S. Bhattacharya
 291 N. C. Sen Gupta
 292 N. Banerjee •
 293 A. C. Mookherjee
 294 S. M. Ghatak
 295 S. N. Roy
 296 M. C. Biswas

297 A. Islam
 298 J. M. Guha
 299 B. D. Muhari
 300 S. K. Bose •
 301 H. P. Dass
 302 B. Banerjee
 303 B. K. Rohatgi
 304 A. K. Bose
 305 M. L. Dey
 306 P. B. De
 307 N. B. Basu
 308 M. L. Sanyal
 309 P. B. Ghose
 310 S. C. Bose
 311 A. K. Banerjee Chowdhury
 312 C. L. Prosad
 313 P. C. Sarkhel
 314 A. C. Sarkar
 315 S. C. Chatterjee
 316 S. R. De Bhowmik
 317 G. M. Pettera
 318 Saileswar Sanyal
 319 K. M. Majumdar
 320 K. C. Datta
 321 N. C. Sen
 322 A. K. Mukherjee
 323 P. C. Chatterjee
 324 J. Chowdhuri
 325 K. L. De
 326 J. M. Palit
 327 N. Chowdhuri
 328 S. N. Mukherjee
 329 Triguna Ch. Sen
 330 J. B. Chatterjee
 331 S. K. Biswas
 332 A. K. Bose •
 333 S. C. Chakraborty
 334 H. D. Chatterjee
 335 A. K. Adikari
 336 S. C. Biswas
 337 P. N. Addy
 338 P. K. Chowdhuri
 339 Paritosh Bosu
 340 N. K. Roy

- | | | | |
|-----|-------------------------|-----|--------------------------|
| 341 | B. N. Lahiri | 385 | N. L. Joglekar |
| 342 | N. N. Saha | 386 | H. K. Biswas |
| 343 | George Sidney Mead | 387 | S. R. Dutt |
| 344 | S. K. Basu | 388 | J. N. Dey |
| 345 | G. D. Metha | 389 | S. P. Ganguli |
| 346 | J. N. Das Gupta | 390 | J. N. Basu (Rai Shahib) |
| 347 | Dr. B. N. Dey | 391 | S. N. Biswas |
| 348 | Sri S. L. Huckoo | 392 | Dinesh Chandra Acharji |
| 349 | T. C. Bhattacharji | 393 | Narendra Nath Rudra |
| 350 | Abdul Majid | 394 | S. S. Gupta |
| 351 | A. P. Ghosh | 395 | Sanat Kumar Choudhury |
| 352 | A. K. Chowdhury | 396 | S. K. Gupta |
| 353 | K. D. Banerjee | 397 | Hoq N. R. Samar |
| 354 | N. N. Mondal | 398 | Jatindra Mohan Palit |
| 355 | A. N. Banerjee | 399 | K. P. Chattapadhyay |
| 356 | Gopal Chandra Bose | 400 | B. K. Das |
| 357 | Harihar Chatterjee | 401 | S. M. Ghosh |
| 358 | R. M. Sinha | 402 | D. Chatterjee |
| 359 | Sunny Gupta | 403 | S. K. Dawn |
| 360 | Md. Abdul Ghafer | 404 | Sushil Kumar Ghosh |
| 361 | A. K. Bose | 405 | N. N. Neogi |
| 362 | R. C. Chakraborti | 406 | Salil Kumar Roy |
| 363 | N. C. Bopejee | 407 | Satish Chandra Paul |
| 364 | K. C. Majumdar | 408 | S. C. Mukherjee |
| 365 | A. N. Sen Gupta | 409 | P. Sen Gupta |
| 366 | N. K. Ganguli | 410 | Hira Lal Roy |
| 367 | M. M. Chatterjee | 411 | Nagendra Nath Chatterjee |
| 368 | J. Sahaj Pal | 412 | N. R. Das |
| 369 | N. N. Choudhury | 413 | Bijoy Kumar Chatterjee |
| 370 | Santosh Kumar Ghosh | 414 | B. M. Ghosh |
| 371 | K. C. Sen Gupta | 415 | A. Brahmachary |
| 372 | B. Narain | 416 | Bamandas Chatterjee |
| 373 | A. R. Gupta | 417 | R. N. Basu |
| 374 | L. M. Saraswati | 418 | Rai Mahan Banerji |
| 375 | Sanat Kumar Banerjee | 419 | T. V. Swami |
| 376 | Sarat Chandra Sen | 420 | N. K. Mitra |
| 377 | Keshava Ch. Srivastav | 421 | A. D. Joardar |
| 378 | Nani Lal Das Gupta | 422 | M. N. Guha |
| 379 | Tulsi Das Gonda | 423 | Nirod Baran Biswas |
| 380 | P. S. Sharma | 424 | Om Prakash Bansal |
| 381 | Sunil Kumar Dhar | 425 | S. N. Sen Gupta |
| 382 | Anil Chandra Chatterjee | 426 | Abani Pati Banerjee |
| 383 | D. M. Roger | | |
| 384 | B. K. Apte | | |

427 B. C. Ghose
 428 B. K. Acharyya
 429 S. Narayanan
 430 Tarun Kumar Roy
 431 Arun Kumar Mitra
 432 Ramani Mohan Das
 433 Subodh Kumar Banerjee
 434 Amarendra Nath Halder
 435 K. C. Bora
 436 Probodh Chandra Bose
 437 Keshab Chandra Dutt
 438 Naliniranjan Bose
 439 S. C. Chatterjee
 440 Dr. Y. Sen
 441 Nilratan Mukherjee
 442 B. K. Ghosh
 443 Lalit Mohan Mukherjee
 444 B. B. Majee
 445 P. Panday
 446 Narendra Kumar Chakraborty
 447 Saifuddin Ahmed Choudhury
 448 K. S. Dhar
 449 Sailendra Nath Bakshi
 450 L. M. Varma
 451 R. A. Tolly
 452 N. K. Mukherjee
 453 Jajneswar Karmakar
 454 G. C. Mukherjee
 455 M. Jinnot Ali
 456 I. K. Narayan
 457 K. L. De
 458 Satish Chandra Bose
 459 S. C. Nandi
 460 Gunendra Nath Banerjee
 461 B. P. Singha
 462 Rakhal Chandra Ghosh
 463 Monindra Prasad Ghosh
 464 S. N. Chatterjee
 465 Bijendra Mohan Ghosh
 466 Bibhuti Bhusan Basu
 467 K. L. Chatterjee
 468 Sisir Kumar Basu
 469 S. N. Ghosh
 470 J. K. Das

471 H. C. Guha
 472 Sudhir Kumar Chakrabarty
 473 Chandra Bhan Gupta
 474 B. R. Barua
 475 Kali Charan Mitter
 476 M. Jagadesan
 477 K. G. Kotwani
 478 A. N. Chatterjee
 479 W. C. Dey
 480 Atul Krishna Basu
 481 A. C. Bhattacharyya
 482 K. D. Chatterjee
 483 Sudhir Kumar Dutta
 484 Taj Bahadur Singh
 485 Asutosh Mazumdar
 486 Sarat Chandra Mitra
 487 S. Padhi
 488 Babu Ram Sarma
 489 Adhir Kumar Chakrabarty
 490 Saroj Nath Mukherjee
 491 A. K. Paramanik
 492 Nirmal Singh
 493 N. K. Sen (Rai Bahadur)
 494 Samarendra Nath Basak
 495 N. R. Sarwal
 496 H. K. Roy Choudhury
 497 Murari Mohan Ganguli
 498 Subodh Kumar Mukherjee
 499 Manak Chand Mehra
 500 Monoranjan Guha
 501 Joy Gopal Ghosh
 502 Ram Krishna Das
 503 Sashi Bhusan Gupta
 504 Gopal Chandra Ganguli
 505 Abani Mohan Mitra
 506 Amarendra Nath Roy
 507 A. B. Nag
 508 V. D. Deodhar
 509 Anil Kumar Sen
 510 Sailesh Chandra Dutta
 511 Sushil Kumar Mitra
 512 Provakar Barman
 513 Omkar Nath Goyal
 514 K. M. Banerjee

515 B. P. Sinha
516 B. K. Bhattacharjee
517 Gostha Behari Saha
518 R. C. Mahalanobis
519 B. K. Acharya
520 H. N. Chakrabarty
521 Arun Kumar Banerjee
522 Aubhoy Ch. Mukherjee
523 Ajit Kumar Sen Gupta
524 Sisir Kumar Ghosh
525 Rasbehari Das
526 Nagendra Nath Banerjee
527 P. B. Dutta
528 P. C. Sarkar
529 B. K. Chakrabarty
530 P. C. Bose
531 Jai Mongal Singh
532 D. Vachaspati
533 Probodh Ch. B arjee
534 Bhupendra Nath Chatterjee
535 P. C. Chandra
536 Ramdas Banerjee
537 D. S. Banerjee
538 Bholanath Sen
539 P. F. Ghadialy
540 Jatindra Mohan Chatterjee
541 Nanda Lal Bhattacharjee
542 S. K. Bhattacharjee
543 D. N. Gupta
544 Dharendra Nath Gupta
545 G. N. K. Iyer
546 K. Bhattacharjee
547 Ganesh Lall
548 Ram Nath Khosla
549 H. N. Majumdar
550 M. Jagadesan
551 T. N. Das
552 P. J. Matthew
553 H. S. Purakayestha
554 B. B. Majumdar
555 B. Parsad
556 N. L. Sarkar
557 D. K. Kotoky
558 N. K. Ghosh

559 N. G. Chatterjee
560 K. Venkatapathy
561 S. L. Shome
562 Martanda Bose
563 Sushil Kumar Ghosh
564 Nirmal Kumar De
565 Sarat Chandra Chakravarti
566 N. N. Ganguli
567 Ram Chandra Mitra
568 Sailendra Nath Banerjee
569 Ajit Chandra Das
570 H. B. Roy Choudhury
571 B. S. Charan
572 A. R. Palit
573 Dwarikanand Sahay
574 A. K. Jackson
575 Probhas Chandra Ghosh
576 H. C. Bhattacharya
577 Devaki Nandan Prasad
578 Lokendra Nath Joardar
579 Siddheswar Gupta
580 Anil Kumar Adhikari
581 B. K. Roy Chowdhury
582 Jatish Chandra Sen
583 Amiya Kanta Datta
584 B. B. Das Gupta
585 C. M. Shahani
586 N. G. Chakrabarti
587 Sudhir Kumar Chatterji
588 Sunil Kumar Bose
589 C. K. Chaudhury
590 Ashu Tosh Sircar
591 A. P. Bhatla
592 N. R. Sircar
593 Bhagwan Dan
594 Ramchandra P. Varma
595 Sudhir Bhusan Roy
596 Nandalal Mukherjee
597 B. N. Chatterjee
598 Robindra Nath Das
599 Brojendra Nath Das
600 Sailendra Ch. Mukherjee
601 G. N. Mitra
602 B. K. Chakravarty

603 Anil Behari Ghosh
 604 Sukhendra N. Chakrabarty
 605 N. C. Bose
 606 Narendra Kumar Das
 607 Saroj Bandhu Roy
 608 Subol Chandra Banerjee
 609 Sunder Sing Bhatia
 610 Sukumar Mukherjee
 611 Prem Priya Guha
 612 G. V. Sree Ram Murthy
 613 Brojendra Mohan Basu
 614 Nagendra Nath Rakshit
 615 Nandalal Bhattacharjee
 616 Anil Kumar Mukherjee
 617 Jitendra Kumar Roy
 618 Narendra Nath Datta
 619 K. P. Chattopadhyaya
 620 Sunil Kumar Biswas
 621 Nirmal Kumar Biswas
 622 D. S. Desai
 623 Ranjit Kumar Chatterjee
 624 A. P. Dalmia
 625 B. B. Mookherjee
 626 D. V. Rama Rao
 627 K. B. Roy
 628 J. N. Mitra
 629 M. N. Datta
 630 Jitendra Nath Ghosh
 631 N. C. Mukherjee
 632 Ratneswar Ghosh
 633 Sanat Kumar Majumdar
 634 Anil Kumar Sen
 635 P. U. Menon
 636 Sukumar Chandra Das
 637 Nirmal Chandra Sanyal
 638 Suresh Chandra Banerjee
 639 Satish Chandra Ghosh
 640 A. C. Banerjee
 641 Tarak Chandra Das
 642 Tarak Pada Gupta
 643 Z. Khan
 644 J. B. Rana Bahadur
 645 Balwant Sing
 646 Kanai Lal Ghosh

647 Md. Ismail
 648 Jyotish Chandra Ghosh
 649 H. S. Wasal
 650 B. N. Datta
 651 Kamal Chandra Chatterjee
 652 R. N. Guha
 653 S. K. Bosh
 654 D. K. Nandi
 655 Mihir Kumar Bose
 656 J. S. Varman
 657 Kumud Bandhu Dey
 658 Birendra Mohan Sen
 659 George W. O. Howe
 660 Probodh Kumar Chatterjee
 661 Durga Das Banerjee
 662 Chandidas Joardar
 663 Ramendra Nath Sarkar
 664 Gobinda Mall Sharma
 665 Sudhir Chandra Bose
 666 Eree R. Shroff
 667 Suresh Chandra Ganguli
 668 Karunamaya Datta
 669 Gangadhar Dutta
 670 A. K. Sen Gupta
 671 Kiron Bandhu Chattopadhyaya
 672 Digambar Chanda
 673 Kalisankar Guha
 674 Anadi Krishna Chatterjee (4)
 675 H. K. Ganguli
 676 Narendra Chandra Bhattacharjee
 677 Charu Chandra Chatterjee
 678 Hemanta Kumar Nag
 679 Saroj Kumar Chatterjee
 680 K. C. Basu
 681 Sree Nath Mitra
 682 Binode Behari Sen
 683 A. B. Mukherjee
 684 Ashutosh Chowdhury
 685 Ashutosh Ghosh
 686 Harendra Nath Chatterjee
 687 Kulada Sankar Dhar
 688 Bidhu Bhushan Ghosh
 689 Nagendra Nath Ganguli
 690 Kali Nath Datta

691 Durga Das Banerjee
 692 S. A. Ahmed
 693 Rabindra Nath Das
 694 D. N. Chatterjee
 695 K. C. Bose
 696 Anand Krishna Huckoo
 697 Durga Charan Mukherjee
 698 Bibbuti Bhushan Mallik
 699 Amiya Dhone Mukherjee
 700 Kali Prasad Acharya
 701 Bhai Karunes
 702 Dwijesh Chandra Bagchi
 703 Amarendra Kumar Ghosh
 704 M. S. Rajagopalan
 705 K. Chakrabarty
 706 D. P. N. Arunha
 707 Sachindra Nath Ghosh
 708 Hiron Kumar Ghosh
 709 Nirmal Chandra Guha
 710 S. C. Dev
 711 St. Nirmal Tej Singh
 712 S. L. Mathur
 713 Ram Behari Singh
 714 B. P. Shrivastava
 715 N. K. Sen Gupta
 716 Sibprasanna Dutt
 717 Kesab Chandra Sen
 718 Muralidhar Roy
 719 D. Chakrabarty
 720 H. Phalora
 721 S. P. Nandi
 722 Sudhir Kumar Biswas
 723 D. R. Chowdhury
 724 Tilok Raj Mohan
 725 Kalyan Kumar Chakrabarty
 726 Nanda Lal Gupta
 727 Bhupendra Nath Banerjee
 728 Kamini Mohan Choudhuri
 729 Pulin Behart Mitra
 730 Rabindra Nath Chaki
 731 Kiron Chandra Paul
 732 Bimal Chandra Mitra
 733 Arun Kumar Das
 734 Dev Tandan,

735 Paritosh Mittra
 736 Usha Ranjan Gupta
 737 Capt. M. R. Malhotra
 738 Nishith Nath Basu
 739 Gobinda Lal S. Malik
 740 Ajit Kumar Ghosh
 741 Swarnendu Kumar Das
 742 Nikhil Chandra Roy Chowdhury
 743 Gour Chandra Saha
 744 Swadesh Ranjan Sengupta
 745 Kumud Bhushan Roy
 746 Bejoy Kumar Charabarty
 747 Sudhanshu Mitra
 748 Hires Chandra Sarkar
 749 Amaresh Kumar Bose
 750 Prafulla Chandra Saha
 751 Manindra Nath Dutta
 752 Kamakhya Charan Sengupta
 753 Sudhangsu Sekhar Naiya
 754 Bhagwant Prashad Sharma
 755 Saroj Kumar Ghosh
 756 B. Mukunda
 757 Hans Tuckerbeaker
 758 G. B. Ghose
 759 A. C. Dutta Gupta
 760 W. N. Chandu
 761 Ajit Kumar Chatterjee
 762 S. C. Bhattacharjee
 763 M. N. Putatenda
 764 K. D. Roy
 765 Horshadari Bhattacharjee
 766 S. C. Mukherjee
 767 K. L. Banerjee
 768 B. K. Ganguli
 769 K. Ch. Chakrabarty
 770 Balaram Banerjee
 771 A. T. Burman
 772 Kishori Mohan Das
 773 H. L. Roy Ghatak
 774 K. Gupta
 775 M. H. Patel
 776 M. K. Biswas
 777 A. K. Roy

[Continued to page 122]

[Continued from 104]

82. Dey, Dhirendra Nath,
3, Chowringhee Lane, Shyambazar,
Calcutta-4.
 83. De Sircar, Rakhal Chandra,
49/2, Middle Road, Calcutta-14.
 84. Dutta, Sukha Ranjan,
1, I. Lines, (MES), Alipore,
Calcutta-27.
 85. Dutta, Jagadish Chandra,
P. O. Nilambazar, Dist. Cachar,
Assam.
 86. Dutt, Amiyo Bhusan,
P. O. Japla, Palamau, Bihar.
 87. Dutta, Subrata,
11/B, S. R. Das Road, Calcutta 26.
 88. Dutta, Manash,
105, Ekdalia Road, Calcutta-22.
 89. Dam, B. K.
19, Salimpur Road, Calcutta-31.
 90. Das Gupta, Birendra,
Irrigation and Water Ways Direc-
torate, Kiranhar, P. O. Mallarpur,
Dt. Burdwan.
 91. Dutta, Ajit Ranjan,
Lahiri Nibas, Avirampur, P. O. &
Dt. Malda.
 92. Das Gupta, Anil Chandra,
M/s. Building & Construction,
14/1, Beliatala Lane, Calcutta-9.
 93. Das, Debesh Chandra,
9-B, Avenue First Road, Calcutta-32.
 94. Datta, Subodh Kumar,
14-A, Jatin Das Road, Calcutta-29.
 95. Das Subhas Chandra,
P-29, Shahid Dinesh Gupta Road,
Calcutta-34.
 96. Dutta, Salil Kumar,
25, Sardar Sankar Road, Calcutta-29.
 97. Dutta, Ashit Krishna,
48, Sarat Ghosh Garden Road,
Calcutta-31.
 98. Das, Mrinmoy,
Tripura Engineering College, P. O.
Birendranagar, Tripura.
 99. Das, Pralay,
4040, Sansom Street, Philadelphia,
PA19104, U. S. A.
 100. Datta, Tapan Kumar,
4724, Second Avenue, Detroit, Michi-
gan, U. S. A.
 101. Das Gupta, Shayamal,
4224, Osage Avenue, Philadelphia.
PA 19100, U. S. A.
 102. Dutta Gupta, S. S.
3, St. Georges Gate Road, Flat C-15,
Calcutta-22.
 103. Das Chowdhury, M. K.
Dakshin Pally, P. O. Sodepur,
24, Parganas.
- G.**
104. Gupta Virendra Kumar,
178/A, Kankulia Road; Calcutta-19.
 105. Gose, Dwarik Nath,
1, Beni Banerjee Avenue, Calcutta.
 106. Gupta H. S.
247, Jodhpur Park, Calcutta-31.

107. Ghosh, Mihir Kiron,
66/4, Russa Road East, Calcutta-31.
 108. Ghosh, Minendra Nath,
1, Garstin Place, Calcutta-1.
 109. Ghosh, Ranjit,
48/5-A, South Sinthi Road,
Calcutta-50.
 110. Gurnani, P. D.
1E-D, Park Street; Calcutta-16.
 111. Ghosh; Bholanath;
6, Chalta Bagan Lane, Calcutta-6.
 112. Ghosh, Prabir Kumar,
5A, Ganendra Mitra Lane,
Calcutta-4.
 113. Guha, Sankar,
513, Jodhpur Park, Calcutta-31.
 114. Ghash, Prasanta Kumar,
124, Northern Avenue, Calcutta-37.
 115. Gupta, Dipak,
3931, Pine Street, Philadelphia,
PA 19104 USA.
 116. Ghosh, Amitava,
apt. 35A, 4224 Osage Avenue,
Philadelphia, PA 19104 USA.
 117. Giri Radhashyam,
Rental Housing, Flat J-I, Belgachia
Road, Calcutta-37.
 118. Ganguly, Bimalangsu Sekhar,
15/A, Deshapriya Park Road,
Calcutta-26.
 119. Ganguli, Dharendra Nath,
36-A, Chandra Mandal Lane,
Calcutta-26.
 120. Ganguli, Samanta Kumar,
31, Chittaranjan Avenue,
Calcutta-12.
 121. Gangapadhyay, Sisir Kumar,
District Building Inspector, Calcutta
Corporation, Calcutta-13.
 122. Ghadialy, P. F. •
43, Queens Road, Bombay-2.
 123. Ghosh, Amal Kumar,
p. 210, Lake Terrace, Calcutta-29.
 124. Ghose, Jagat Bandhu,
P. 49, Golf Club Road, Tollygunge,
Calcutta-33.
 125. Ghose, Mahesh Chandra,
P. 11, Lake Terrace, Calcutta-29.
 126. Ghosh, Panchanan,
23-B, Sardar Sankar Road,
Calcutta-29.
 127. Ghosh, Provash Chandra,
294, Rash Behari Avenue, Calcutta-19.
 128. Ghosh, Subodh Ranjan,
69-B, Ekdalia Road, Ballygunge,
Calcutta-19.
 129. Ghosh, Supriya,
30, Ibrahimipore Road, Calcutta-32.
 130. Guha, Surya Kumar,
11-A, Southern Avenue, Calcutta-26.
 131. Gupta, Usha Ranjan,
106/4, Hazra Road, Calcutta-26.
- H**
132. Halidar, Amarendra Nath,
115, Princep Street, Calcutta-13.
- I**
133. Iyer, A. Anantha Rama,
The Associated Battery Makers
(Eastern) Ltd., Savoy Chambers,
12, Wallace Street, Fort, Bombay-1.

K

134. Khemka, Arun Kumar,
128, Southern Avenue, Calcutta-29.
135. Karmakar, Jajneswar,
9-G Rani Sankari Lane, Calcutta-26.
136. Karunes, Bhai,
92, Upper Circular Road, Calcutta.
137. Kothari, Hemraj,
12, India Exchange Place,
Calcutta-1.
138. Maj. S. Khanna,
B-6, Asaf Ali Road, New Delhi.
139. Kusarye, Dharendra Kumar,
Kusarye Lodge, Darjeeling.
140. Koshai, Prakash Chandra,
49, Bajoria Nagar, Yeotmal (N. S.).

M

141. Mukhopadhyay, Snehangsu Seknar,
19, Rajendra Banerjee Road, Behala
Calcutta-34.
142. Mazumdar, Nripendra Mohan,
Asstt. Engineer, Farakka Barrage
Project, P. O. Farakka,
Dt. Murshidabad.
143. Moitra, Bhowani Prosad,
36-A, Shyambazar Street, Calcutta-4.
144. Mukherjee, Somir Kumar,
8/3-A, Nepal Bhattacharjee Lane,
Calcutta-26.
145. Mitra, S,
47/1, Hazra Road, Calcutta-19.
146. Mohanty, Sadananda,
Express High Way Project,
Bhubaneswar, Orissa.

147. Nambata, Amala,
Nagen Bala Smriti Kutir, Jhargram,
P. O. Jhargram, Midnapore.
148. Neogi, Sisir Kumar,
1, Garstin Place, Calcutta-1.
149. Niyogi, Pradyot Kumar,
2256-C, Goodrich St. Fairlake
Apartments, Sacramento, Calif,
95825, U. S. A.
150. Nath, Jananendra Chandra,
22, Panditia Place, Ballygunge,
Calcutta-29.
151. Nandi, Sanatan,
116/A, B. T. Road, Calcutta-35.
152. Neogi, Dharendra Nath,
13, Deshapriya Park Road,
Calcutta-26.

P

153. Paul, Sudhangsu Ranjan,
Kalyan Co-operative Colony,
P. O. Birati, Calcutta-51.
154. Paul, Sadananda,
'Matri Nivas', Panchantala,
Kalupukur, Chandernagar
Dist. Hooghly.
155. Paul, Ajit Kumar,
17/5-D, Raja Manindra Road,
Calcutta-37.
156. Paul, Chandika Prasad,
12/B, Monohar Pukur Road,
Calcutta-26.
157. Paul, Kiron Chandra,
1-B, Old Post Office Street,
Calcutta-1.

158. Pal, Pramod Ranjan,
Engineer, Mohurgong & Gulam Tea
Estate; P. O. Gilma, Darjeeling.

R

159. Rathod, Payrelal Deoram,
North Tentulia Colliery,
P. O. Katrasgarh, Dt. Dhanbad,
Bihar.

160. Roy, Ajit Kumar;
28/18, Dhakuria Station Road,
Calcutta-31.

161. Roy Choudhury, Samir Kumar,
119, Feeder Road, P. O. Belgharia,
Dt. 24, Parganas.

162. Roy, Jadavendra Nath
S. V. P. C. Co. Ltd., P. O. Japla
Cement Factory, Palamau, Bihar.

163. Majumdar, Sankardas.
Dy. Director; Govt. Test House;
Alipore; Calcutta-27.

164. Misra, Biraj Mohan.
7-B, Jugi Para Bye Lane.
Calcutta-6.

165. Majumdar, Birendra Nath,
6A, Manmath Bhattacharjee Street.
Calcutta-4.

166. Mitra, Sukumar,
4-G, Ganesli Sarkar Lane,
Calcutta-23.

167. Mitra, Apurba Krishna,
3, Ananda Chatterjee Lane,
Bagbazar, Calcutta.

168. Mitter, Manaranjan,
3H, Mahesh Dutta Lane, Calcutta-27

169. Mitra, Monindra Narayan,
537, Dum Dum Road, Govt. Qrt.
Block—L, Flat-3, Calcutta-28.

170. Mitra, Sushil Kumar,
2-A; Gopal Biswas Lane;
Calcutta-4.

171. Mitra, Nihar Kumar,
56, Cripser Road P. O. Konnagar,
Dt. Hooghly.

172. Mukherjee, Bibhuti Bhusan,
'Namami', Gangulipara, P. O. Bally,
Howrah.

173. Mukherjee, Keshablal,
52-G, Hazra Road, Calcutta-19.

174. Mukherjee, Nani Gopal,
71, Victoria Road (South),
Calcutta-36.

175. Mukherjee, Ram,
16-F, Remount Road, Calcutta-27

176. Mukherjee, Sukumar,
7C, Abinash Banerjee Lane,
Calcutta-10.

177. Mukhopadhyay, Ajitendra Nath,
29-A, Lake Avenue, Calcutta-29.

178. Roy, Girindra,
C/O, Surgent and Lundy,
140, South Dearborn Street,
Chicago, Illinois, USA.

179. Ray, Bishnupada,
22, Biswas Nursery Lane, Calcutta.

180. Dr. Rajamony, N. I.,
Engineering Consultants, C/O M.
N. Polytechnic, Pondichery-1.

181. Reddi, Kurra Rami,
Principal, K. D. R. Polytechnic,
Wanaparthi, (A. P.).
182. Ray, Amarendra Nath,
14/1, Kashinath Chatterjee Lane,
Sibpore, Howrah.
183. Roy, Promotha Chandra,
Dy. Director, 1 Ganesh Chandra
Avenue, Calcutta-13.
184. Roy, Chitta Bhusan,
103/1, D. L. Roy Road, P. O.
Krishnagar, Nadia.
185. Rohatgi Ravindra Krishna,
45, Armenian Street, Calcutta.
186. Roy, Kshetra Bhusan,
10, The Mall, Dum Dum.
187. Roy, Kamakshya Charan,
P-703/D, Block 'P', New Alipore,
Calcutta-53.
188. Roy, Paresh Chandra,
31, Rammohan Dutta Road,
Calcutta-20.
189. Roy, Sukhmoy,
7-G, Gour Sunder Sett Lane,
Calcutta-2.
190. Roy Basu, Kula Bhusan,
P-461 C. I. T Sch. 47, Calcutta-29.
191. Roy Burman, Biranjit Kumar,
8/5B, Russa Road, Calcutta-26
192. Saha, Birendra Nath,
P-143, Lake Road, Calcutta-29.
193. Saha, Birendra Kishore,
1A, South Sealdah Road, Calcutta-15.
194. Saha, Prafulla Chandra,
14/2B, Northern Avenue,
Calcutta-37.
195. Sanyal, Prasanta Sankar,
6/2, Pan Bagan Lane, Calcutta-14.
196. Saksena, Kumar Chandra,
43-B, Block 'C', New Alipore,
Calcutta-53.
197. Srakar, Ashok Nath,
2, Lake Terrace, Calcutta-29.
198. Sirker, Hires Chandra,
Narain Roy's Bari Baraduway,
P. O. & Dist. Hooghly.
199. Shukla, Bal Krishna,
7/1, Lake Terrace, Calcutta-29.
200. Sen Kesab Chandra,
Sreepalli, P. O. Santineketan,
Dt. Birbhum.
201. Sen, Bibhuti Bhusan,
32, Mohan Bagan Row,
Shyambazar, Calcutta-4.
202. Sen, Subodh Chandra,
30/1/G, Gopal Nagar Road,
Calcutta-37.
203. Sen Gupta, Sushil Kumar,
5/1, Kashi Mitra Ghat Street, Flat
No. C-2, Calcutta-3.
204. Sen Gupta, Indu Bhusan,
Central Engineering & Develop-
ment Division, Design Department,
Tata Iron & Steel Co. Ltd.
Jamshedpur.

206. Sen Gupta, Jitendra Nath,
110, Chittaranjan Avenue,
Calcutta-12.
206. Sen Gupta, Kalyan Kumar,
'Hemlata'; 15; Srirampur Road;
P. O. Garia, 24, Parganas.
207. Sen Gupta, Nikhil Ranjan,
15/2, Balaram Ghose Street,
Calcutta-4.
208. Sutradhar, Bivekananda,
Foreman Inspectorate of
Armaments, P. O. Armapur,
Kanpur, U. P.
209. Samaddar, Mrinal Kanti,
Asphaltum Department, 1/2, Ratan
Babu Road, Calcutta-2.
210. Sanger, N. S.
Etah Dairy, Etah (U. P.)
211. Sen Gupta, Mrinal.
1, Middleton Street, Calcutta-16.
212. Sen Gupta, Ranjit Kumar,
131, Netaji Subhas Ch. Road,
Block—19, Flat—2, Calcutta-40.
213. Sachdev, A. P.
Raja Mansion, Gokhale Road,
Calcutta-20.
214. Sen-gupta, B. R.
Housing Estate, Flat No. K/4,
VIP Road, Calcutta-54.
215. Sircar, Shivaji,
213, S 42nd Street, Philadelphia,
PA 19109, U.S.A.
- V
216. Venkatesam, V. A. M.,
P-146, Anil Road, Calcutta-29.
227. Verma, Satyendra Kumar,
Supdt., B/R Gr. I, C/O, Garrison
Engineer, M.E.S. P. O. KalaiKunda
A. F., Midnapore.
218. Vijayanathan, K. R.,
C/O, Mr. O. D. Samuel, Room
No. 27, YMCA Wode House Road,
Fort, Bombay-1.
- Y
219. Yadav, K. G.
16, Jadu Mitra Lane, Calcutta-40.

GRADUATES (A. E.)

.B

1. Banerjee, Manaranjan, Jig & Tool
Drawing Office, Hind Motor; P. O.
Gondalpara; Chandernagar;
Hooghly.
2. Baul, Paritosh Kumar,
72/2, Sree Aurobinda Road, Salkia.
3. Banerjee Jayanta Kumar,
Flat No. C-2, 59, Dum Dum Road,
Calcutta-28.
4. Basak, Mihir Kumar,
Charaktala Avenue, P. O. Sodpur,
24, Parganas.
5. Bhattacharjee, S. K.,
64/122-A, Belgachia Road,
Calcutta-37.

C

6. Chakraborty, B. K.
15, Satya Charan Sastri Street,
P. O. Mahes. Dt. Hooghly.
7. Chatterjee, Kalyan, CMPO
1, Garstin Place, Calcutta-1..

D

8. Das, Bibekananda.
52/2, Kashinath Dutta Road,
Calcutta-36.
9. De, Sinharan,
26/7, Jhill Road, Calcutta-27.
10. Deb Sinha, Kalipada;
P. H. Engineering, Midnapore Sub-
Division, Dak Bungalow Road,
Midnapore.

G

11. Gupta, Kajal,
156, Lnasdowne Road. Calcutta-26.

K

12. Kundu, P. K. CMPO
1, Garstin Place, Calcutta-1.

M

13. Mukhopadhyay, R.
Ola bibitala Lane, Sibpore,
Howrah-2.
14. Majumdar, Arbinda,
38/2-B, Biplabi Pulin Das Street,
Calcutta-9.
15. Mukherjee, Dilip Kumar,
98/B, Aurobinda Saranee, Calcutta-6

R

16. Ray, Kalyan Kumar,
17-B, Swinhoe Street, Calcutta-19.

S

17. Sinha, P. C. CMPO
1, Garstin Place. Calcutta-1.
18. Sen, Dipak,
Mechanical Engg. Deptt., Jadavpur
University, Calcutta-32.
19. Sen Dipak,
29/A, Gopi Mohan Dutta Lane,
Calcutta-3.
20. Sen Gupta, Prafulla Kumar,
Sr. Chargeman, CESC Ltd., P. O.
Baudia, Howrah.

STUDENTS (A. E.)

B.

1. Biswas, Sunil Kumar,
Foreman M/Shop, Wagon Works,
Jessop & Co. Ltd.,
41/1-A, Bagbazar Street, Calcutta-3.

C

2. Bose, Sreejit Madhab;
60/A, Ritchie Road. Calcutta-19.
3. Chibba; Ramesh Kumar;
109/18, Hazra Road, Calcutta-26.

L

4. Lal, Krishnan;
1121, Sector 19-B, Chandigarh.

R

5. Rohatgi, Kumar Krishna,
46, Armanian Street, Calcutta.

S

6. Singh Balbir,
S. P. North Qr. No. 18B-64, C. L.
Works, Chittaranjan,
7. Singh, Jagar,
Fitter (Motor Mechanic), Qr.
No. C/2A St. No. 27 Chittaranjan.
8. Sundlass, D. S.
St. No. 62 Qr. No. 12D, C. L.
Works; Chittaranjan.

ASSOCIATES (A.E.)

B

1. Basu, Kanailal,
Burn & Co. Ltd. Howrah. Kona,
Vill. & Dist. Howrah.
2. Banerjee, Amarendra Nath,
4, Thakur Radhakanta Lane, P. O.
Baghbazar, Calcutta-3.
3. Bhowmik, Amalendu,
6A, Keyatala Road, Calcutta-29.
4. Biswas, Birendra Nath,
20/6, Bangur Avenue, Block 'C'
Dum Dum, Calcutta-28.
5. Biswas, Mrinal Kanti,
1, Balaram Lane, P. O. Chinsura,
Hooghly.

D

6. Das, Sisir Kumar,
77, Abinash Banerjee Lane,
Calcutta-10.

Dev, S. R.
N. C. D. C Ltd., Gidi 'C' Colliery.
P. O. Religarh, Dt. Hazaribagh,
Bihar.

7. Dass, G. N. C.
136, Noor-Ullah Road, Karala Bagh.
Allahabad City, Zone-3.
8. Dey, Ranjit Kumar,
Tractor Supervisor, Mechanical
Stores. School Danga, P. O. & Dist
Bankura.
9. Dutt, Amal Kumar,
76/6, Bidhan Sarani, Calcutta-6.
10. Dutta, Gopal Chandra,
28-A, Sarat Ghosh Street, Calcutta-14

G

11. Garga, M. G.,
190-R, Model Town. Sonapat,
Delhi.

12. Ghosh, Amarendra Kumar,
69-A, Tala Park, Calcutta-2.

13. Ghosh, Rabindra Nath,
C/O, P. N. Ghosh, 24, Sahid Khudiram Bose Road, Budge Budge,
24, Parganas.

14. Guha, Amarendra Nath,
728 Block 'P', New Alipore,
Calcutta-53.

M

15. Mitra, Arun Chandra,
Mitrapara Road, Naihati,
24, Parganas.

R

16. Roy, Prodosh Ranjan,
P-8, Beliaghata Main Road,
Calcutta-10.

17. Roy Chowdhury, Pradip,
C/O, R. N. Das Construction,
Burdwan Road, Siliguri, Darjeeling.

S

18. Sarkar, Sukhendra Krishna,
33, Palit Street, Calcutta-19.

19. Sen, Birendra Mohan,
P-164; Lansdowne Road Extn.;
Calcutta-26.

20. Singh, Arjun,
81, Dev Lane, Calcutta-14.

21. Sen Gupta, Sudhangsu Sekhar,
44, Italdar Para Lane, Calcutta-26.

22. Sarkar, Shakti Kumar,
120/3, Narsing Dutta Road,

23. Sen Gupta, A. K.
57, Aswarth Road, P. O. Garifa,
24, Parganas.

EX-MEMBERS

[Continued from Page—113]

778 A. K. Mukherjee

779 M. Mukherjee

780 B. Bari

781 P. S. Kothari

782 F. Guin

783 A. N. Kerr

784 P. C. Koshal

785 S. C. Neogi

786 S. Dutta

787 N. Haque

788 R. K. Chibba

789 H. B. Rai Chowdhury

790 S. M. Bose

791 P. K. Sanyal,

792 C. R. Das

793 B. Singh

794 D. S. Sundlar

795 J. Singh

796 Archit Kr. Banerjee

PREDECESSORS IN OFFICE

Presidents :

- Sri S. K. Dutta, M.A., Dipl. Ingr.,
M.A.E., 1919-1924 [deceased].
- Sri B. C. Gupta, I.E.S., F.A.I.E.E.
M.A.E. 1925-1928 [deceased].
- Rai A. N. Das Bahadur, B.E., M.I.E.,
M.A.E. 1928-1933 [deceased].
- Rai G. C. Das Bahadur, B.E., M.A.E. 1934-1937 [deceased].
- Dr. B. N. Dey, D.Sc. [Glas], M.A.E., M.I.E.
F.R.S.A. [Lond.], 1938-1942 [deceased].
- Sri K. M. Mukherjee, B.A., B.E., M.A.E.,
M.I.E., 1943-1945 [deceased].
- Sri P. C. Bose, B.SC. [Glas], C.P.E. [Glas],
M.A.E., M.I.E., F.N.I., 1945-1948.
- Sri S. Bandopadhyaya, B.SC. [Glas], C.P.E. [Glas],
M.A.E., M.I.E., 1949-1951.
- Sri J. C. Ganguli, M.A.E. 1952. [deceased]
- Dr. J. N. Basu, V.D.I., A.M.E.E., Dr. Ing.
M.A.E., M.I.E. 1953-1955.
- Sri T. K. Ghosh, B.SC., [Glas], C.P.I. [Glas],
M.A.E., M.I.E., 1956-1960.
- Sri A.K. Sen, B.SC. [Glas], C.P.E. [Glas],
M.A.E., M.I.E. 1961-62.
- Sri A. C. Sen, B.SC. [Glas], M.Inst.W. [Lond],
M.I.E., A.M.A.E. 1963-1967
- Col.H.C. Vijn, M.I.E. 1968,
- Sri S. Basu, B.SC. [Glas], M.I.E., M.I.Inst.W. 1969.

Vice-Presidents :

- Rai S. C. Mitra Bahadur, C.E., M.A.E. 1919-1927 [deceased].
- Sri J. C. Banerjee, M.A.E. 1928 [deceased]
- Sri S. N. Ghose, B.SC. [Glas], M.Inst.C.E.,
M.I.E., M.A.E. 1928-1929, 1934-1936 [deceased].
- Dr. B. N. Dey, D.Sc. [Glas], M.A.E. 1930-1934, 1936 [deceased].
- Sri J. N. Das Gupta, B.A., B.E., M.R.San.I,
M.A.E. 1934-1939.
- Sri K. M. Mukherjee, B.A., B.E., M.A.E.,
M.I.E., 1937-1941 [deceased]
- Sri P. C. Bose, B.SC. [Glas], C.P.E. [Glas], M.A.E.,
M.I.E., 1940-1944.

Sri S. Bandopadhyaya, B.Sc. [Glas], C.P.E. [Glas],
 M.A.E., M.I.E., 1945-48
 Sri W. C. Dey, M.A.E. 1945 [deceased].
 Sri R. K. Ganguli, A.M.A.E., A.M.I.M. &
 Cy.E. [Lond], 1946-1947 [deceased].
 Sri A. K. Sen, B.Sc. [Glas], C.P.E. [Glas],
 M.A.E., M.I.E. 1947-1948.
 Sri A. K. Datta, B.E., C.E., M.A.E.,
 M.I.E., 1949.
 Sri J. C. Ganguli, M.A.E. 1949-1951. [deceased]
 Sri R.R. Chibba, M.A.E. 1950.
 Dr. J. N. Basu, V.D.I. Dr. Ing.,
 A.M.F.E., M.A.E. 1951.
 Sri T. K. Ghosh, B.Sc. [Glas], C.P.E. [Glas],
 M.A.E., M.I.E. 1952-1955.
 Sri D. S. Desai, B.Eng. [Sheffld], M.I.C.E. [Lond],
 M.I.E., M.Inst.W. [Lond], A.M.A.E. 1953-1958.
 Sri A. C. Sen, B.Sc. [Glas], M.Inst.W. [Lond], M.I.E.,
 A.M.A.E. 1956-1960.
 Sri G. S. Mitter, M.A.E. 1959-1962.
 Sri N. N. Rudra, B.Sc [Cal], B.Sc. Eng'g [B H.U.],
 M.A.E., A.M.I.E., 1961-1965-1969.
 Sri Sunny Gupta, B.Sc. Eng'g. [Lond], LL.B., M.A.E. 1963-1967
 Sri S. Basu, B.Sc. [Glas], M.I.E. M.A.E, M.I.Inst.W., 1966-1968.
 Sri Kapil Bhattacharyay, B.E., M.A.E. 1968-1969

Hony, Secretaries :

Sri S. C. Sanyal, M.A.E. 1919-1962. [deceased.]
 Sri B. N. Das, B.E., M.A.E. 1927 [deceased]
 Sri H. K. Banerjee, B.E, M.R.San.I, M.A.E, 1928-1930,
 Sri A. K. Sen, B.Sc, [Cal], B.Sc., C.P.E. [Glas],
 A.M.A.E, 1931
 Sri J. N. Das Gupta, B.A., B.E., M.R.San.I,
 M.A.E, 1932,
 Sri R. K. Ganguli, A.M.I.M, & Cy.E, M.R.San.I, A.M.A.E,
 • 1933-1934 [deceased],
 Sri S. Sanyal, B.E, F.R.S.A, M.R.San.I, M.A.E. 1935,
 Sri S. Bandopadhyaya, B.Sc, [Glas]. M.A.E, M.I.E, 1936-1941
 Sri A. C. Banerjee, A.M.I.C.E, [Lond], M.R.San.I,
 M.A.E, 1942 [deceased],
 Sri R. R. Chibba, M.A.E, 1943-1948,
 Sri A. C. Sen, B.Sc, [Glas], M.Inst.W, [Lond],
 A.M.A.E, M.I.E, 1949-1951 [July], 1953-1955,

Sri P. S. Roychowdhury, B.Sc M.A.E. [Aug], 1951-1952, 1956-1959
 Sri C. K. Halder, M.Sc, A.M.A.E, 1955-1956,
 Sri A. Deb, B.E, A.M.A.E, 1960-1964,
 Sri H. Kothari, B.Sc, A.M.I.E, D.W.P, [Lond], M.S.E, [Lond],
 A.M.A.S.M.E, [USA], A.M.A.E, etc. 1965-1968
 Sr S. K. Neogi, B.E, A.M.A.E, 1969,

Hony. Asstt. Secretaries :

Sri C. K. Ghose, A.M.A.E. 1918-1932, 1925-1926 (deceased).
 Sri J. C. Ganguli, M.A.E. 1919-1923, 1927 (deceased).
 Sri P. C. Ghose, A.M.A.E. 1924.
 Sri D. C. Acharyya, A.M.A.E. 1925 (deceased).
 Sri R. N. Das, A.M.A.E. 1927.
 Sri T. N. Mazumdar, I.S.F., A.M.A.F., 1928.
 Sri R. K. Ganguli, A.M. I.M. & Cy.E., M.R. San. I.,
 A.M.A.E. 1924-1926 (deceased).
 Sri R. M. Ghose, A.M.A.E. 1928-1931.
 Sri C. C. Sinha, A.M.A.E. 1929-1931, 1936-1938.
 Sri H. K. Mukherjee, A.M.A.E. 1932.
 Sri K. D. Roy, B.E., A.M.A.E. 1933.
 Sri S. Basu, B. Sc. (Glas), Nav. Arch. (Glas), M.A.E. A.M-I.E.
 1933-1934.
 Sri S. Sanyal, B.E., M.R. San. I., M.A.E. 1934.
 Sri K. C. Biswas, A.M.A.E. 1935. (deceased).
 Sri N.N. Sen, C.E., A.M.A.E. 1935. (deceased).
 Sri J. N. Chakrabarty, A.M.A.E. 1936. (deceased).
 Sri S. C. Chakrabarty, B.E., C.E., A.M.A.E.,
 A.M I.E. 1937.
 Sri A. C. Banerjee, A.M.I.C.E, M.A.E. 1939 (deceased).
 Sri Z. Khan, B.Sc. (Lond) A.C.G.I., A.M.A.E. 1938-1942.
 Sri G. S. Mitter, M.A.E. 1940, 1943, 1948.
 Sri R. R. Chibba, M.A.E. 1941-1942.
 Sri H. N. Chakrabarty, A.M.A.E. 1943-1944, 1963-1964. 1967.
 Sri B. D. Mohury, M.Sc., Eng'g (Del), A.M. Inst. H.E., A.I.A.S.
 (Lond), A.M.A.E. 1944.
 Sri M. N. Mitra. A.M.A.E. 1945-1946.
 Sri S. N. Paul, B.E., A.M.A.E. 1945.
 Sri R. N. Basu, M.Sc. A.M.A.E. 1946-1948.
 Sri H. N. Mukherjee, M.A.E. 1947 (deceased).
 Sri D. N. Dey, A.M.A.E. 1949, 1958-1962.
 Sri P. S. Roychowdhury, B.Sc., A.M.A.E. 1949-1951.
 Sri M. S. Guha Mustaffi, A.M.A.E. 1951-52, 1954, 1955-58,
 1961., 1969.

Sri C. K. Haldar, M.Sc, A.M.A.E. 1952-1953.
 Sri S. K. Sur, B. E., M.A.E., A.M.I.E. 1954,
 Sri P. C. Chakrabarty B.E., A M.A.E. 1955-1956.
 Sri D. N. Roy, A.M.A.E. 1955 (deceased).
 Sri G. C. Saha, B.M.E., A.M.A.E. 1959-1960, 1962-1964.
 Sri R. D. Bansal, A.M.A.E. 1965-1967.
 Sri K. B. Banerjee, M.A., A.M.I.E., M.A.E. 1995-1966.
 Sri K. C. Saxsena A.M.A.E. 1968-1969.
 Sri S. K. Neogi, B.E., A.M.A.E. 1968.

Hony. Treasurers :

Sri J. N. Banerjee, A.M.A.E. (Life). 1919-1923, 1925-1226
 (deceased).
 Sri K. D. Banerjee A.M.A.E. 1924.
 Sri J. C. Ganguli, A.M.A.E. 1927. (deceased).
 Sri N. N. Sen C.E., M.A.E., 1828-1930, 1937-40, 1947-49,
 1953-55. (deceased).
 Sri K. C. Biswas M.R. San.I. A.M.A.E. 1931-33 1943 (deceased)
 Sai Q. A. Rahman, B.Sc., C.E. 1934-1936 (deceased)
 Sri G. S. Mitter, M.A.E. 1941-1942 1944-1946, 1950-1952.
 Sri H. N. Chakrabarty M.A.E. 1955-58.
 Sri K. K. Sen Gupta, B.E., A.M.A.E. 1959-1961.
 Sri M. S. Guha Mustaffi, M.A.E 1962-1664.
 Sri P. S. Roychowdhury, B.Sc. M.A.E., F.V.I. (Lond) 1965-1967.
 Sri B. K. Dam, A.M.A.E., A.M.I.E. 1968-1969.

Hony. Editors :

Sri J. C. Ganguli, A.M.A.E. 1925-1928. (deceased).
 Sri J. N. Basu V.D.I. M.A.E. M.I.E. 1929-1932.
 Sri N. N. Rudra, B.Sc. (Hons) Cal., B.Sc. Eng'g (BHU) ; M.A.E.,
 A.M.I.E. 1933-1936.
 Sri S. Basu. B.Sc. (Glas). C P.E. (Glas). A.M. Inst.W. (Lond.).
 M.A.E., M.I.E. M.I.Mar. Tech. F.I.Conslt.E. 1937-1965.
 Sri A. Deb, B.E, A.M.A.E. 1966-1969.

Hony. Librarians :

Sri K. M. Choudhury, A.M.A.E. 1924-1936, 1942-1944, 1947.
 (deceased).
 Sri P. C. Ghose, A.M.A.E. 1925-1926.
 Sri N. N. Rudra, B.Sc. (Hons. Cal)., B.Sc Eng's (BHU), M.A.E.
 A.M.I.E. 1937-1939, 1950 1954 1960.
 Sir A. C. Banerjee, A.M.I.C.E., M.R. San I. (Lond), A.M.A.E.
 1940-1941 (deceased).
 Sri P. N. Bagchi, L.E. (BHU), A.M.A.E. 1945.
 Sri M. N. Ghosh A.M A.E. 1948 (deceased).
 Sri Z. Khan, B. Sc. (Lond) A.C G I., M.A.E. 1946.
 Sri G. S. Mitter M.A.E. 1949, 1957.
 Sri K. B. Banerjee M A. M A E., A.M.I.E. 1955.
 Sri K. K. Sen Gupta, B.E., A.M.A.E. 1958., 1969..
 Sri A. Deb, B.E., A.M.A.E. 1959.
 Sri B. K. Dam A.M A.E., A.M.I.E. 1961-1967.
 Sri P. C. Roy, A.M.A.E. 1968.

Sri P. S. Roychowdhury, B.Sc M.A.E. [Aug], 1951-1952, 1956-1959
 Sri C. K. Halder, M.Sc, A.M.A.E, 1955-1956,
 Sri A. Deb, B.E, A.M.A.E, 1960-1964,
 Sri H. Kothari, B.Sc, A.M.I.E, D.W.P, [Lond], M.S.E, [Lond],
 A.M.A.S.M.E, [USA], A.M.A.E, etc. 1965-1968
 Sr S. K. Neogi, B.E, A.M.A.E, 1969,

Hony. Asstt. Secretaries :

Sri C. K. Ghose, A.M.A.E. 1918-1932, 1925-1926 (deceased).
 Sri J. C. Ganguli, M.A.E. 1919-1923, 1927 (deceased).
 Sri P. C. Ghose, A.M.A.E. 1924/
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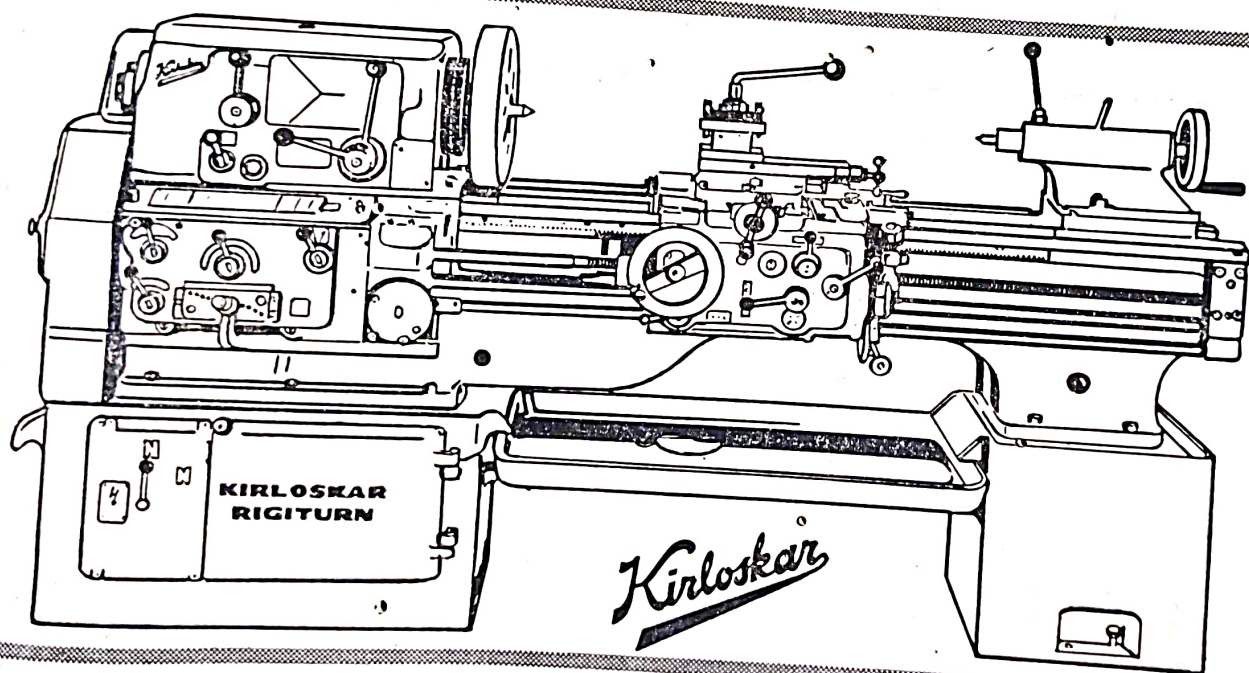
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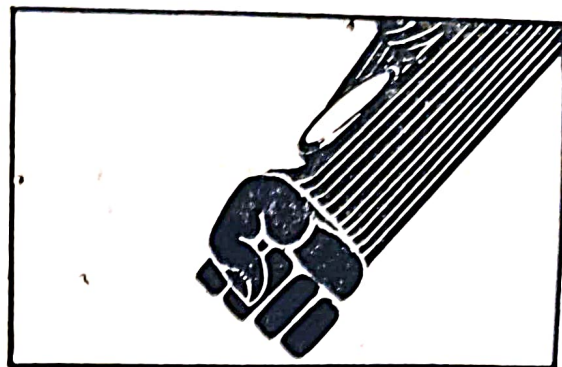
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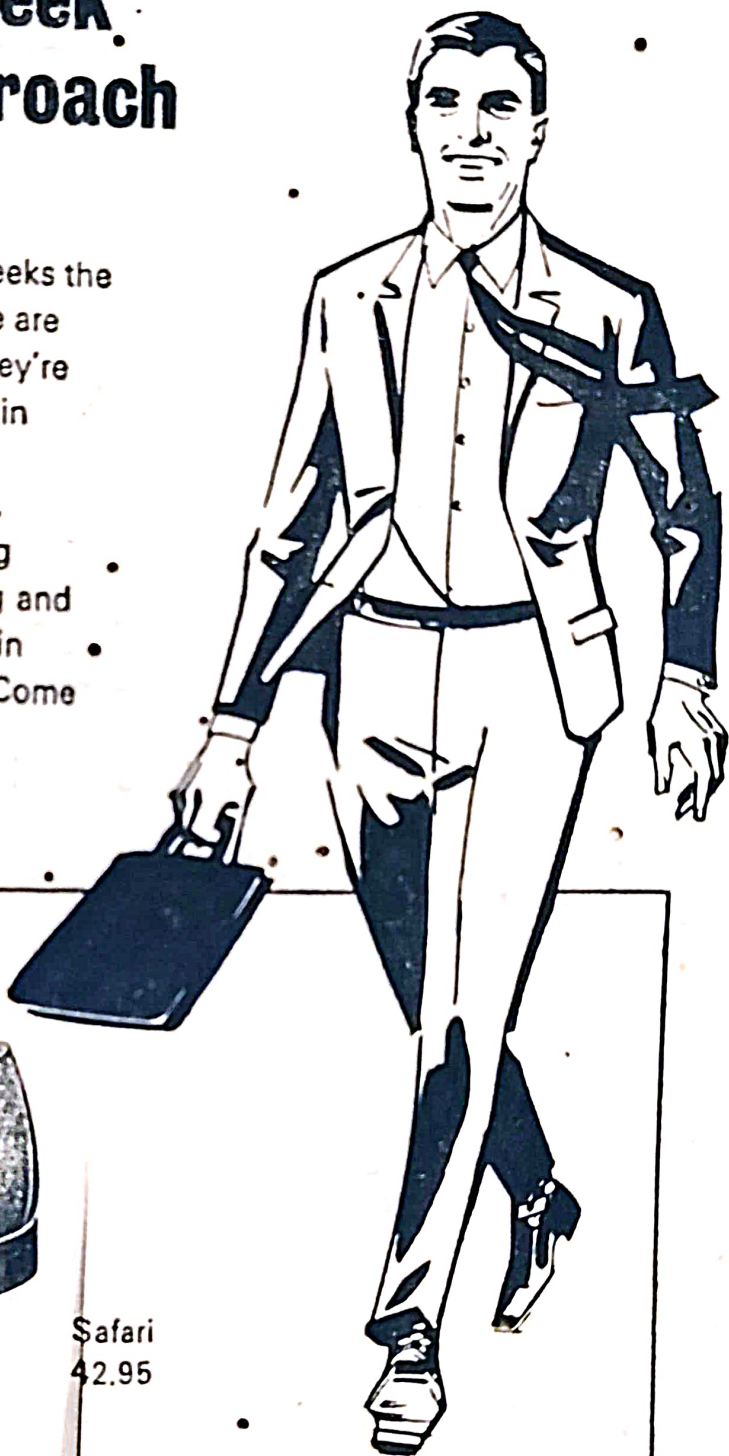


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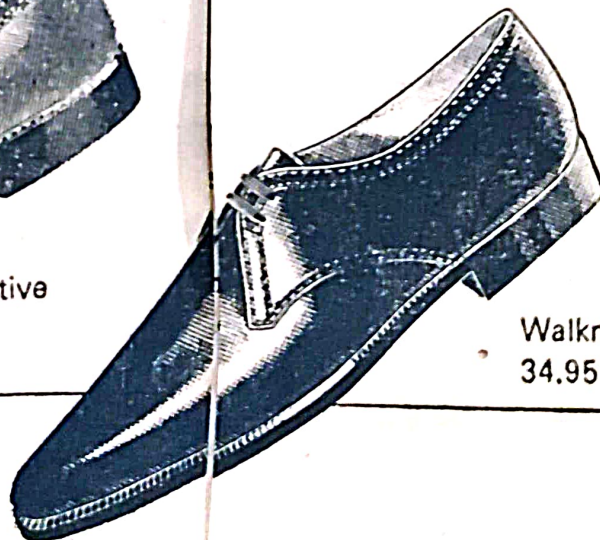
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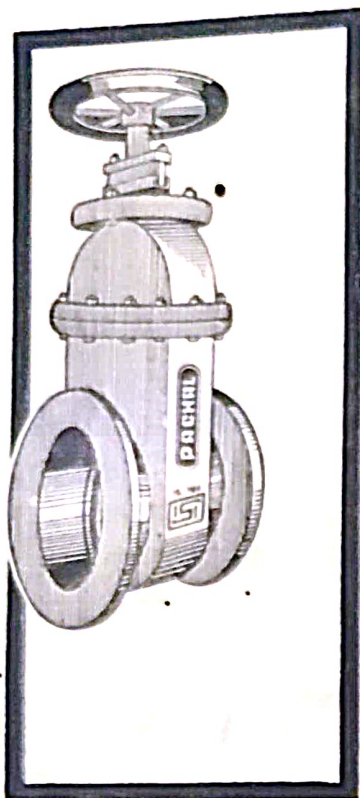
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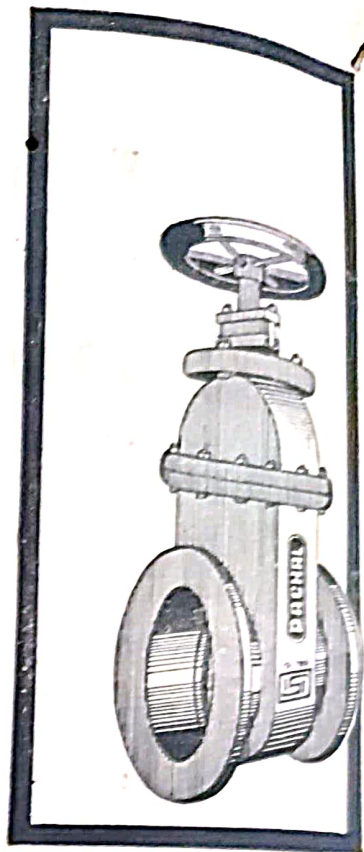
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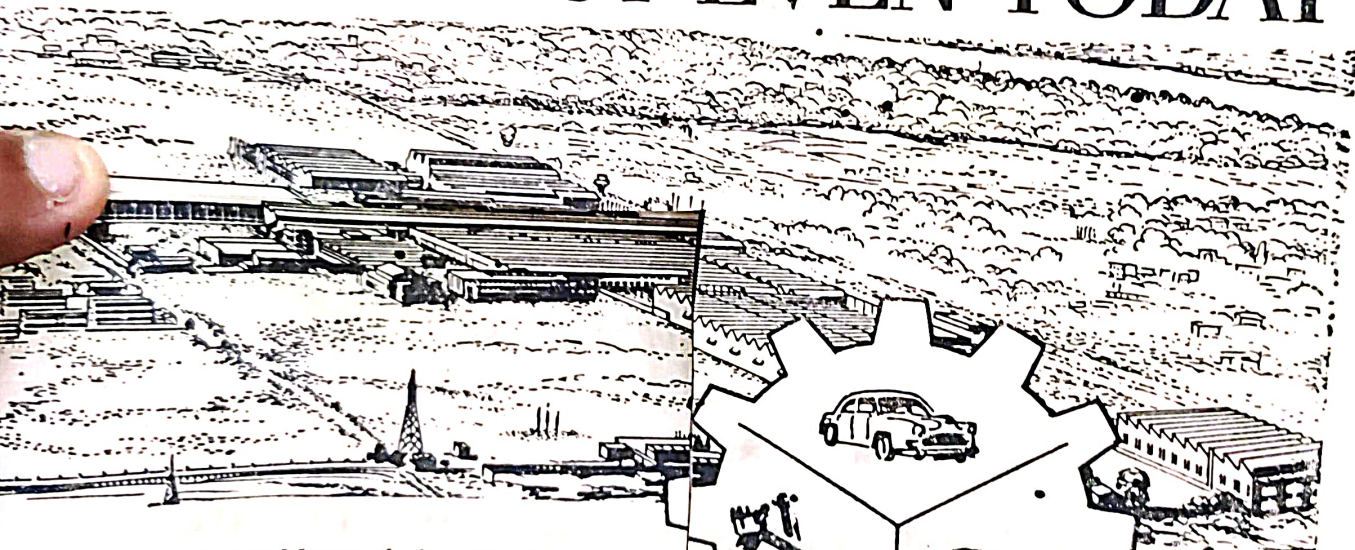
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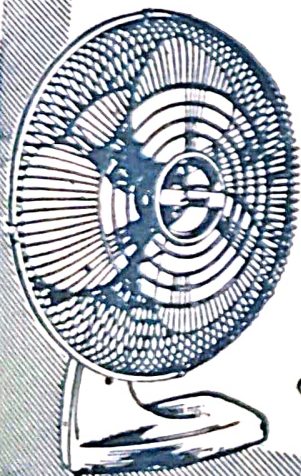
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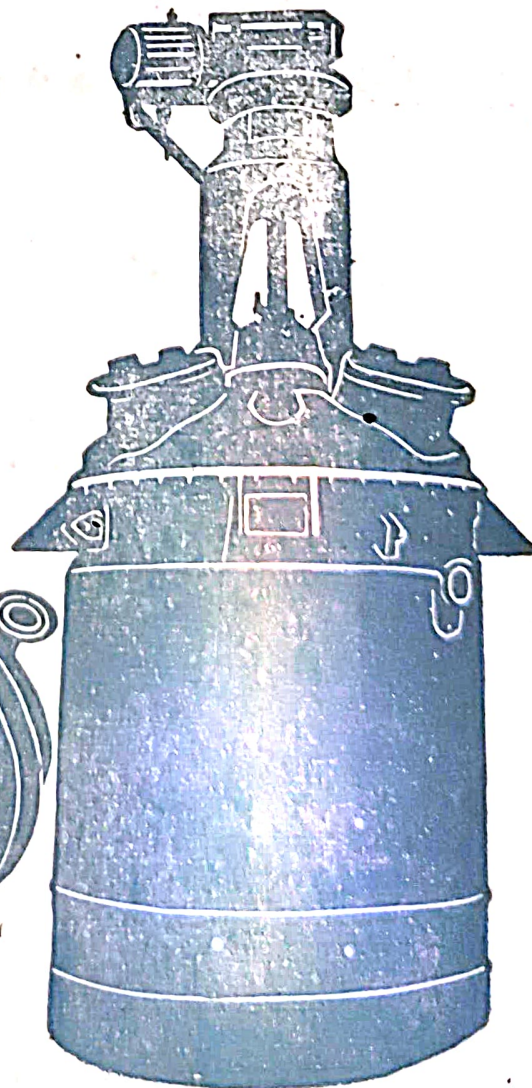


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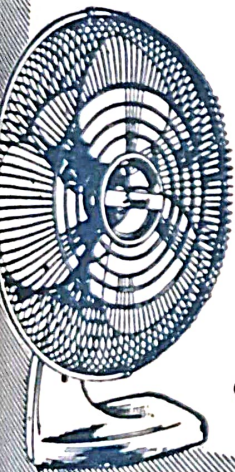
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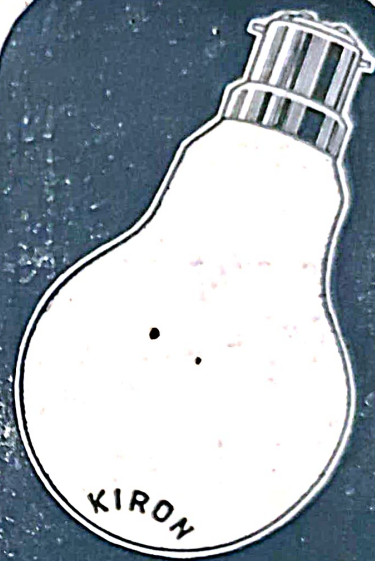
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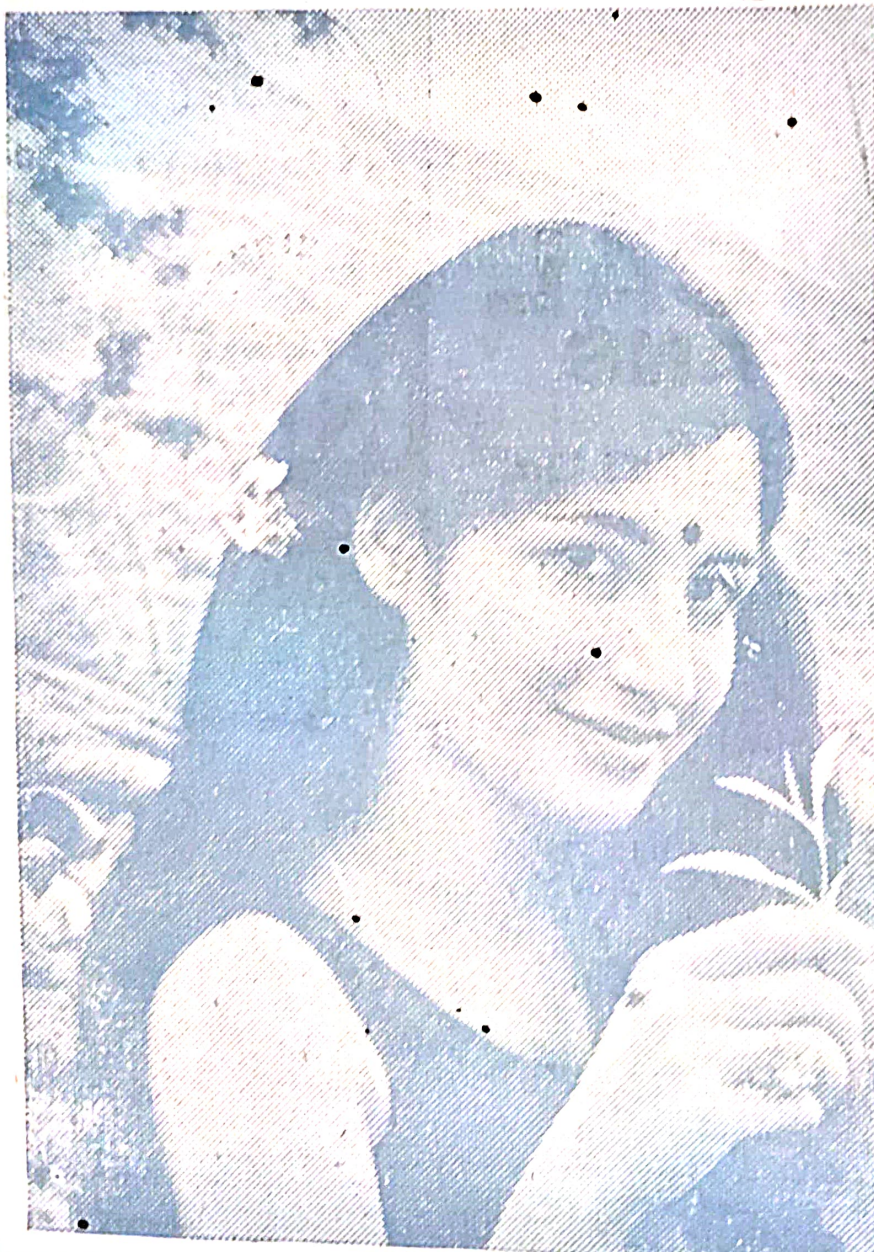
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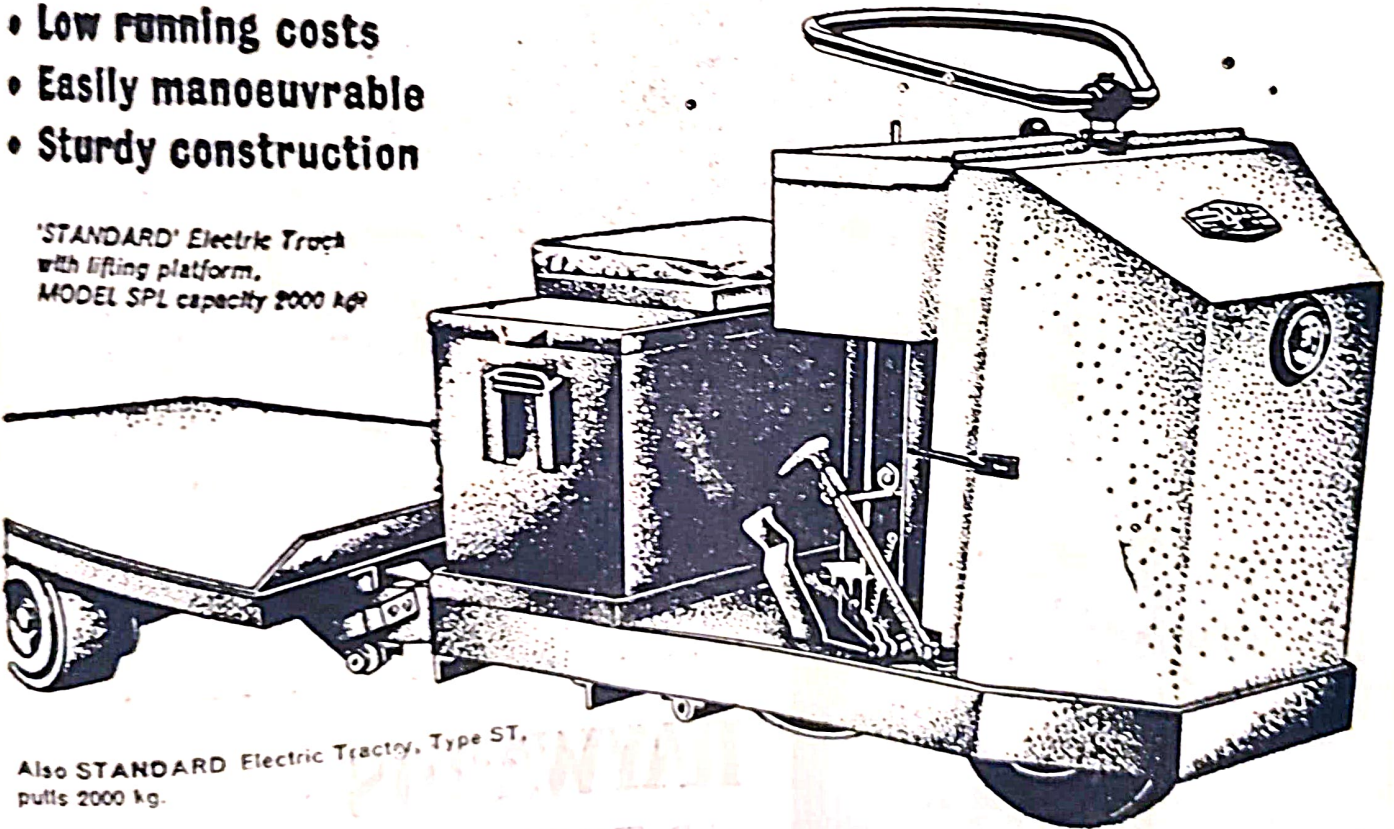
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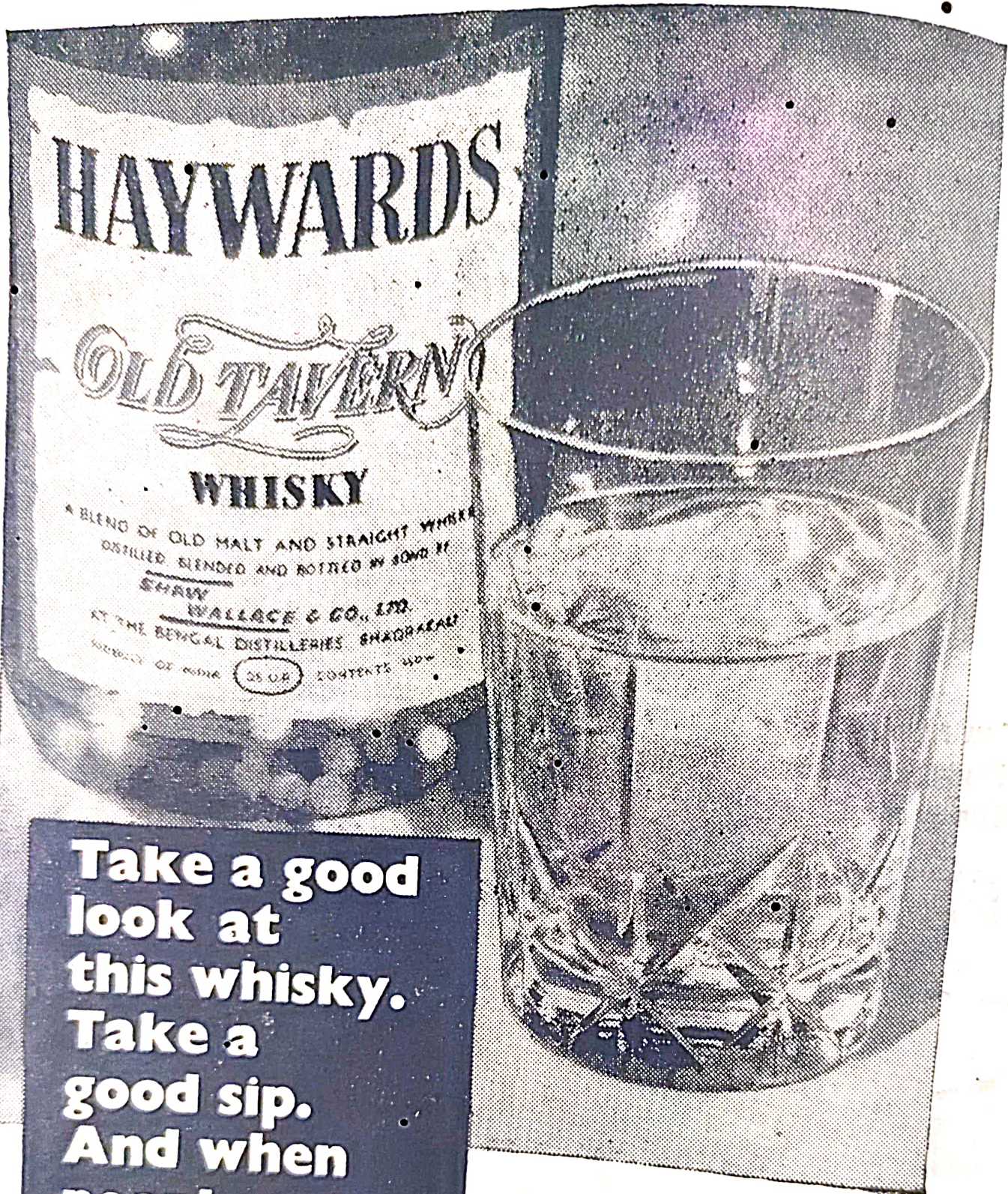
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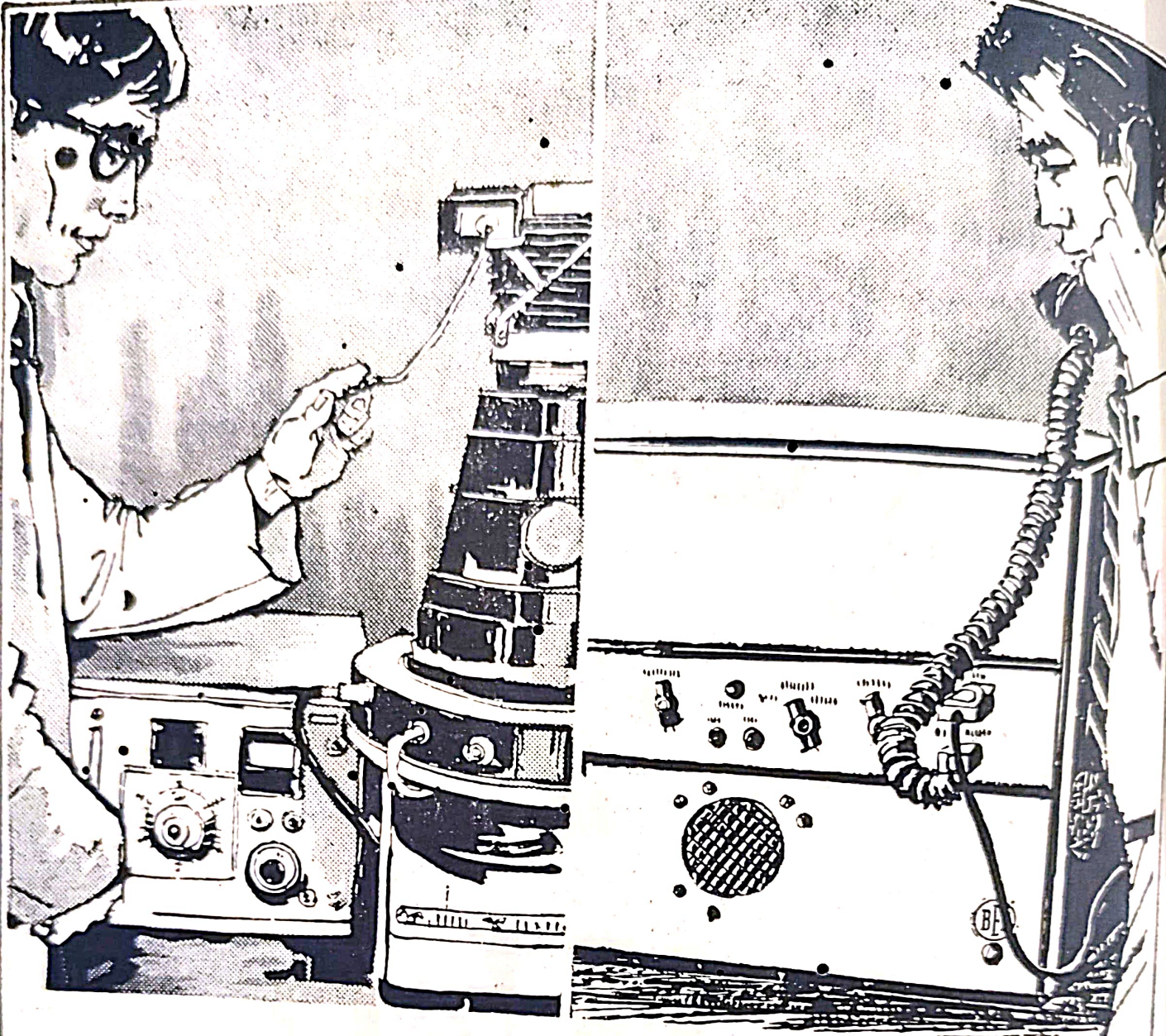
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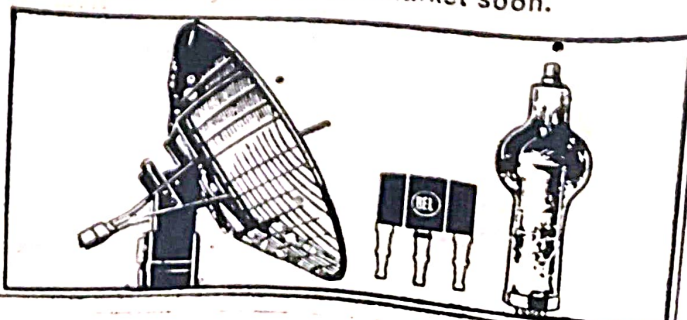
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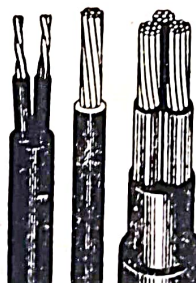
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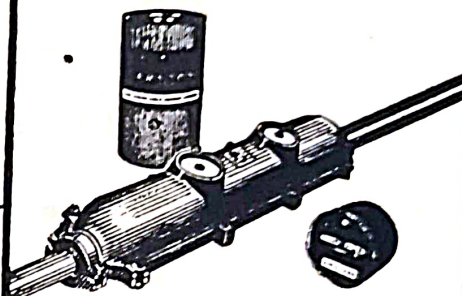
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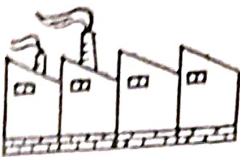
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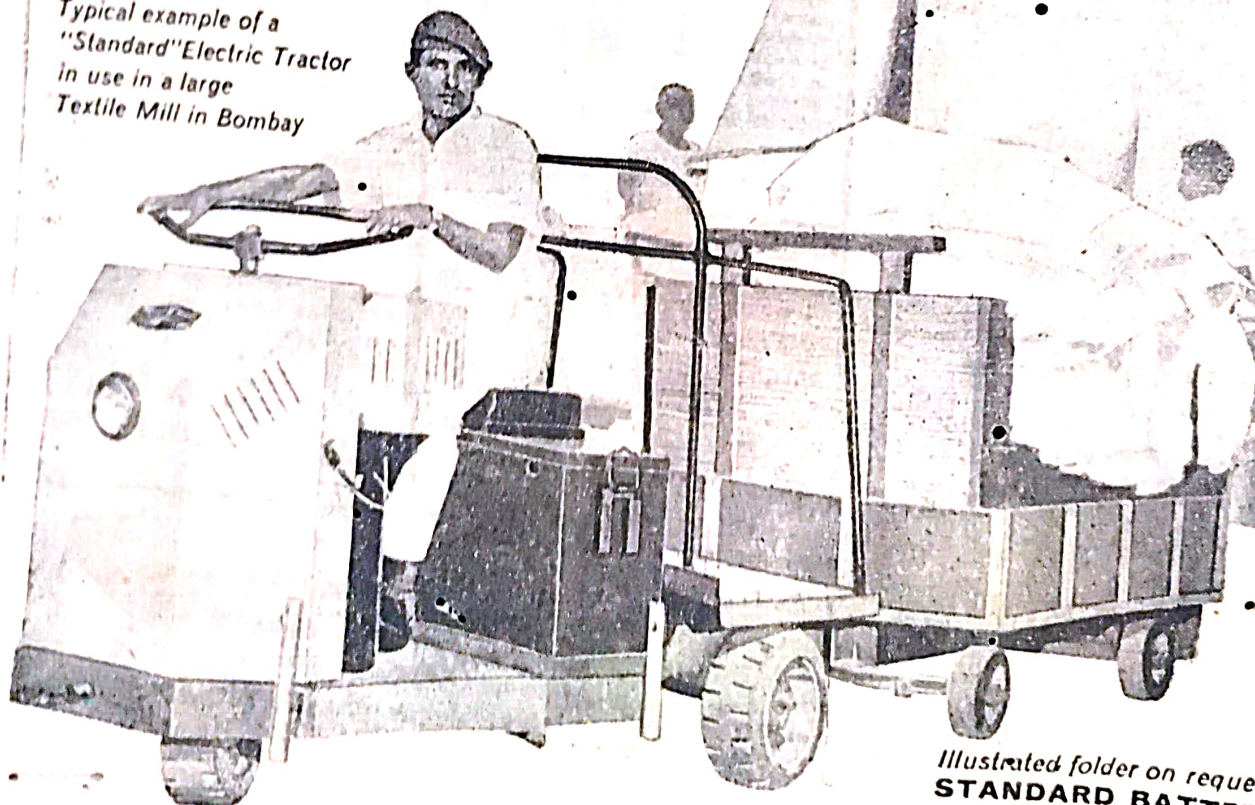
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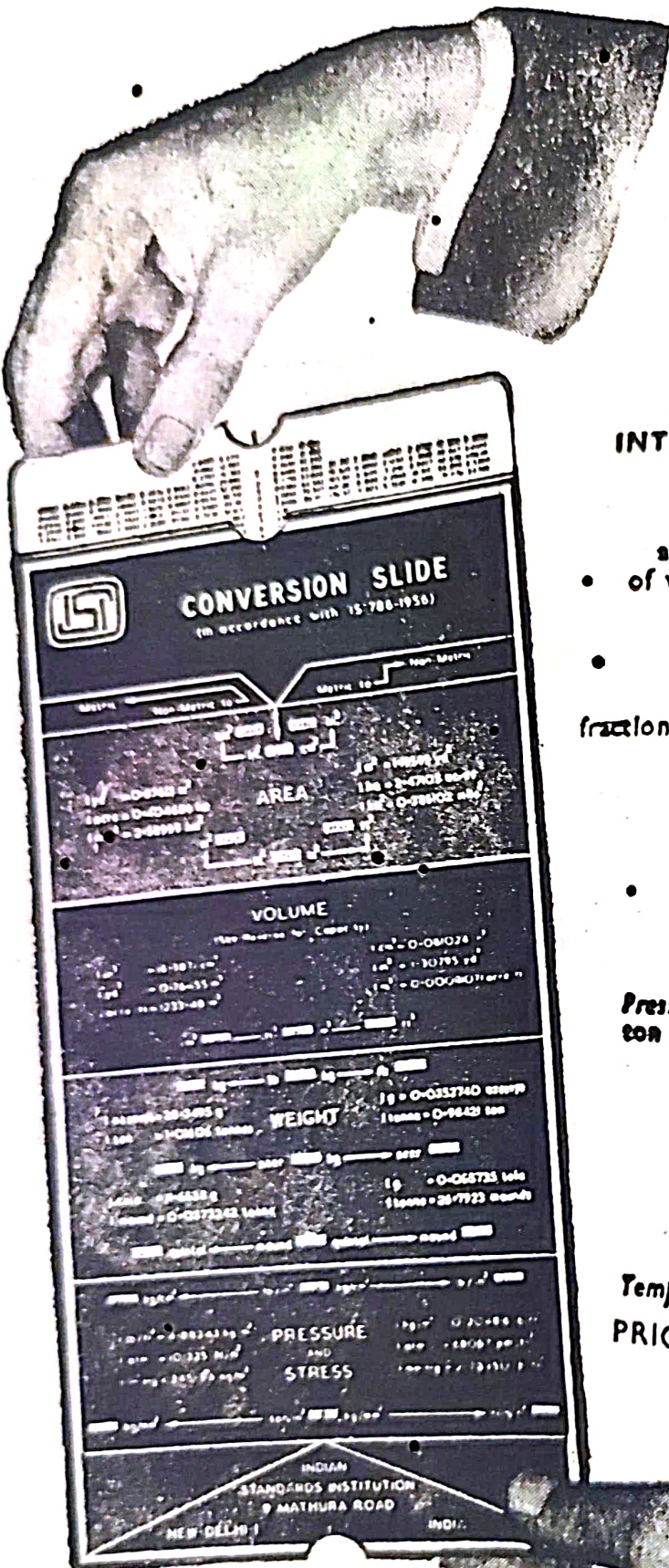
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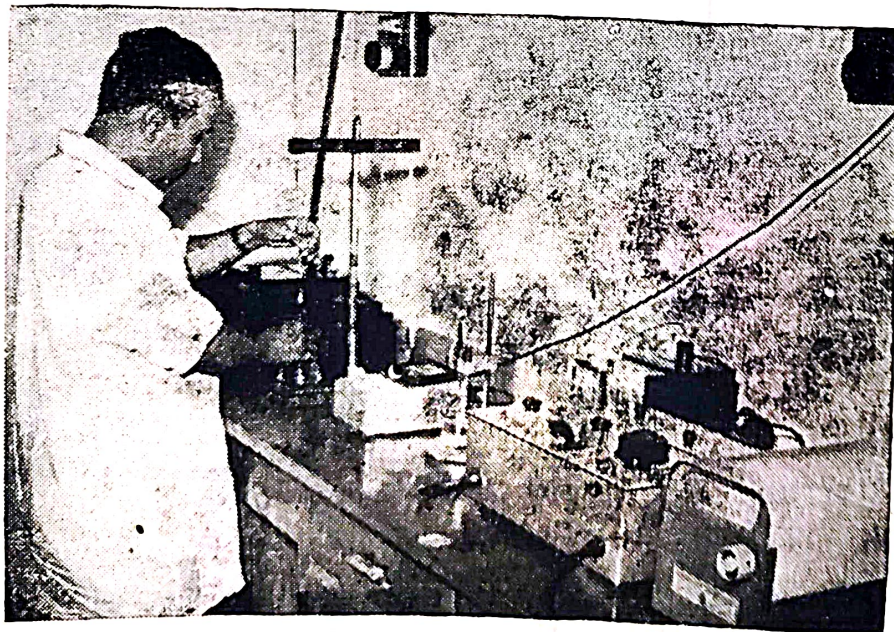
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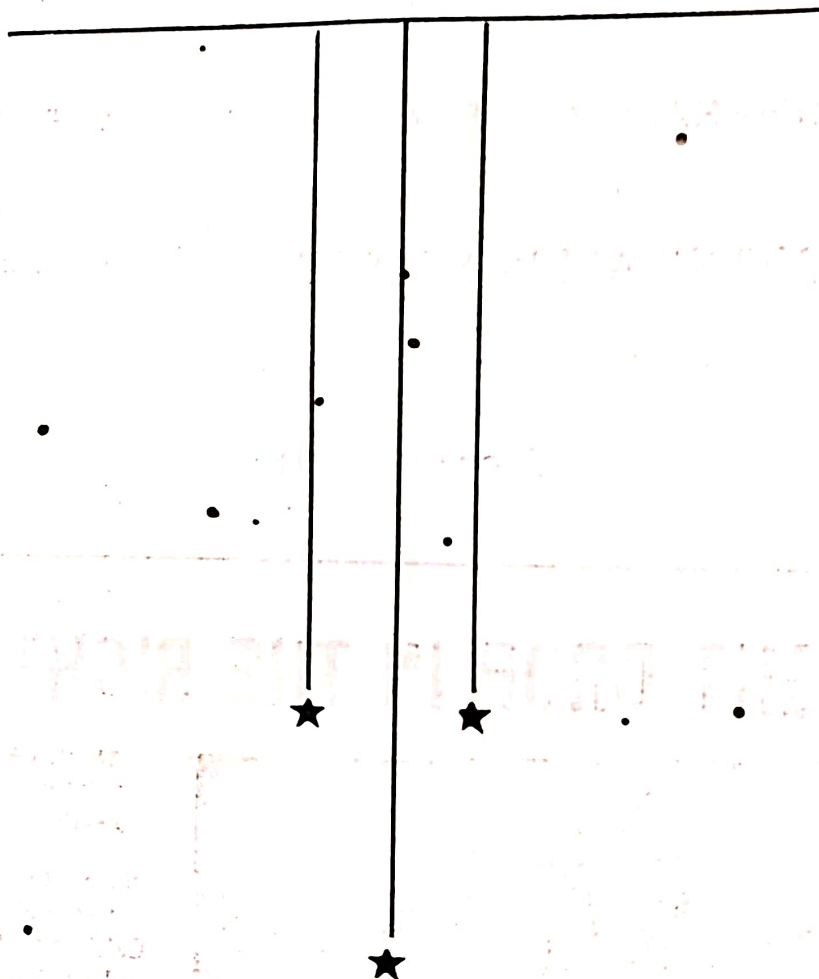
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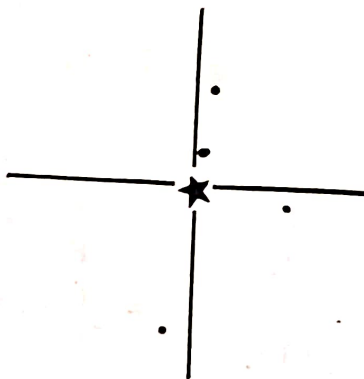
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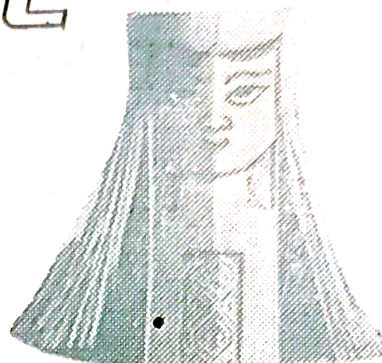
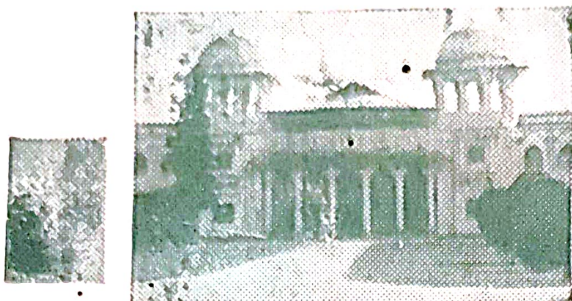
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