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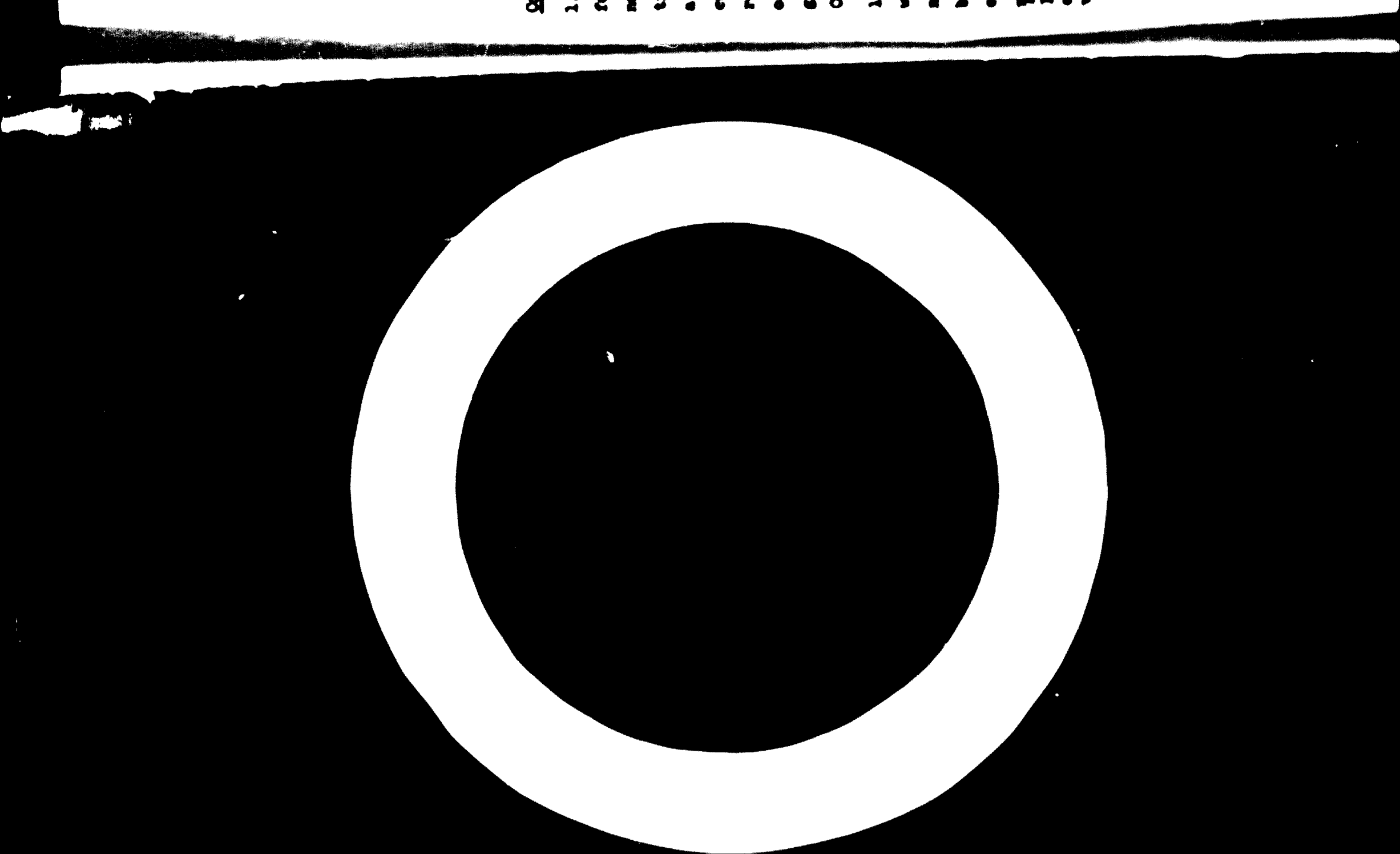
By

Baldev Singh, J. C. Srivastava, and M. C. Chatterjee



RESEARCH AND EXTENSION FOR SMALL-SCALE INDUSTRIES IN INDIA

THE ROLE OF THE COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

By: Baldev Singh
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Council of Scientific and Industrial Research

1.0 The Council of Scientific and Industrial Research (CSIR), the apex organisation for advancement of science and technology, was set up in 1942 in New Delhi as an autonomous body. It was established for the purpose of promotion, guidance and co-ordination of scientific and industrial research in India, establishment and maintenance of a chain of laboratories for fostering scientific studies of problems affecting particular industries and trades, as also fuller exploitation of resources of particular regions of the country. Utilisation of the results of research for the development of industries and collection and dissemination of information in regard to technological researches and other industrial matters constitute an important function of the Council.

1.1 At present there are 30 National Laboratories functioning under the Council which are engaged in conducting researches in the different fields of science and technology. Some of the laboratories have research stations or extension centres distributed all over the country. Some of the National Laboratories are engaged in problems of interest to particular industries while others are concerned with industrial develop-

The authors of this paper are members of the Directorate of Research Coordination and Industrial Liaison of the Council of Scientific and Industrial Research. The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the United Nations Industrial Development Organization.

ment in various regions. In addition to research and survey, these Laboratories render technical assistance to industry through the provision of testing facilities and also through liaison and extension work. This also provides opportunity to industry to sponsor research and development projects suited to them. A list of National Laboratories of the Council helping directly or indirectly small industries is given in Annex I.

1.2 The National Laboratories of the Council also conduct short-term training courses in special subjects for the benefit of technical personnel employed in industry. A list of such training and refresher courses conducted by the Council and National Laboratories during the year 1966 is given in Annex II.

1.3 The Council has also set up three technological museums to portray recent advances in technology through static and working models, posters, diagrams, charts, etc.

1.4 Besides these Laboratories, the Council has also taken steps to promote users' participation in research by financially supporting Co-operative Research Associations, whereby industrial firms, particularly those who cannot afford research and development expenditure on their own, are enabled to participate in research. At present there are 13 Co-operative Research Associations covering such industries as textiles, silk and art silk, rubber, plywood, paints, tea and jute which receive constant assistance and guidance from the Council. Cement, automobile, radio and electronics industries have recently been organised into Co-operative Research Associations.

1.5 The administrative co-ordination and planning are carried out at the headquarters of the Council at New Delhi. In order to execute various functions like planning, liaison, co-ordination and collaboration both within the CSIR organisation and outside, the following units are located at the headquarters:

i. Directorate of Research Co-ordination and Industrial Liaison
ii. Central Designs and Engineering Organisation
iii. Research Survey and Planning Organisation
iv. Directorate of Scientific and Technical Personnel.

1.6 The Council pays particular attention to the extension and utilisation of the results of research for their commercial exploitation. Separate "Industrial Liaison and Information" units are established with each Laboratory. The liaison officers maintain contacts with Chambers of Commerce and Industry, industrial trade associations,

small industries associations, government departments and other users of research. They communicate information on completed researches to industry and feed back industry's problems requiring investigation to the Laboratories. Thus the problems of industry are analysed and identified and brought to the notice of appropriate division for advice and where necessary, for investigation.

Directorate of Research Co-ordination and Industrial Liaison (DRCIL)

2.0 The efforts of the liaison units of the Laboratories are supplemented by the DRCIL located at the headquarters of the Council. This Directorate maintains documented information on research in progress at the various Laboratories. This assists internal co-ordination between the National Laboratories and external co-ordination with other organisations such as Railways, the Indian Council of Agricultural Research, the Indian Council of Medical Research and others. It also maintains contact with the Directorate General of Technical Development, Ministry of Industrial Development, the Central Small Industries Organisation, and other Government organisations responsible for planning and industrial development and thus indirectly supplements the efforts of the liaison units of the Laboratories. It also acts as the contact channel with the National Research Development Corporation for research utilisation. The varied functions of the Directorate at the headquarters are carried out by different constituent cells of the main unit. A Technical Information and Liaison Cell for small industries has been created in the Directorate with a view to achieving closer collaboration of the Council with small-scale industries and Small Industries Service Institutes and other concerned organisations. This Cell provides technical information, guidance and help on the problems of small industries and organises follow-up schemes taken up by the Laboratories on their behalf.

Small Industries Cell

3.0 As there are many organisations in the country which render different forms of assistance to small-scale industries, the first task before the Council was to avoid overlapping of functions and to identify the area where its expertise services could be most usefully and effectively utilised by the industry.

Organisation of Extension Service to Small Industries

3.1 At this juncture it would be pertinent to describe briefly the organisations rendering help to the small-scale industries in India and their functions.

3.1.1 "Small-Scale Industry" is a broad term which includes industries which are run with comparatively low capital outlay. For administrative convenience, the small-scale industries have been defined "to include all industrial units with a capital investment of not more than Rs. 7.5 lakhs (Rs. 0.75 million) in fixed assets irrespective of the number of persons employed". Capital investment for the purpose of this definition means investment in fixed assets like building, plant and machinery This ceiling is relaxable up to Rs. 10 lakhs (Rs. 1 million) in case of ancillary units manufacturing products like industrial and agricultural machinery, machine tools and hand tools, electrical machinery and equipment, radios, electrical and mechanical instruments, transport accessories and equipment, iron and steel foundry and forge shops, etc.

3.1.2 Items covered by small-scale industries have been broadly classified under the following two categories:

(i) a large variety of consumer goods, e.g. bicycles, agricultural implements, sewing machines, domestic electrical appliances, cutlery and domestic hardware, sports goods, hand tools, chemicals, paints, varnishes, etc.

(ii) ancillary industries manufacturing parts, components and accessories, etc. required by large-scale industries and also undertaking repairs, and servicing jobs.

3.1.3 The development of all categories of small-scale industries is the prime responsibility of the state governments. The Government of India, however, has been playing an increasingly important role in planning and co-ordinating the programmes of development, in providing financial assistance to small-scale units. The Central Government Organisation for the development of small-scale industries is headed by the Development Commissioner for Small-scale Industries. Broad functions of the Central Organisation are

(i) Provision of technical consultancy services to small entrepreneurs and to state governments through industrial extension service of the Small Industries Organisation;

(ii) Supplying machinery on hire-purchase and providing commercial and marketing services through the National Small Industries Corporation.

3.1.4 Besides the above organised and semi-organised sectors, there are certain other categories of industries including cottage and village industries. Industries falling under these categories are animal driven oil press, cane gajjery, brown sugar and molasses, oil extraction, leather curing and tanning, pottery, blacksmithy, hand-made paper, and also the traditional industries like handloom, handicrafts, coir and silk, etc. Cottage industries are also the victims of the same set of main problems such as paucity of requisite finance, shortage of raw materials, lack of machinery and equipment, absence of technical know-how, competition from imported articles and products of the large-scale units within the country; inferior quality and standards of production, lack of marketing facilities, etc. In addition, like small-scale industries, they too have got some specific problems peculiar to their own which needs individual treatment. Realising their vital role in the country's economy, the Government of India has undertaken extensive programmes of assistance to these weaker limbs of our industrial structure.

In order to give prompt and needed help to the weaker segment of our industrial structure and to achieve full co-ordination with the work being done by the State Directorates of Industries, the Government of India has set up separate Boards or Commissions, organisations, as mentioned below, to foster the development and promotion of the industries falling within their jurisdiction:

(i) All India Khadi Crafts Board
(ii) Khadi and Village Industries Commission
(iii) All India Handloom Board
(iv) Central Silk Board
(v) Coir Board

3.. The Council of Scientific and Industrial Research has systematic co-ordination with these categories of industries also. The Council is also represented on the board of research of the Khadi and Village Industries Commission.

Council's liaison with small-scale industries - Identification of area of activity

4.0 Reverting to the subject of the Council's co-operation with small-scale industries, the first phase in the Council's co-operation with small-scale industries started with the establishment of contact with the different central and state government organisations connected with small-scale industries. Consequent to this contact the Council became a regular invitee to the meetings of the Small Industries Board - the apex body for deciding the guidelines of policy in respect of small-scale industries as well as for assessing their progress. Exchange of literature and visits of officers of the concerned organisation followed thereafter. Due to the development of close contact with the Small Industries Organisations it was possible for the Council to identify the areas where it could render effective help to this sector. It was also decided that the problems in which the Council would normally assist would be of the following nature:

(i) substitution of imported raw materials with indigenous ones;
(ii) improvement of process and manufacturing techniques;
(iii) improvement of quality and standard of products;
(iv) testing facilities;
(v) utilisation of agricultural and industrial wastes;
(vi) assistance in preparation of technical reports for small-scale industries.

Laying down the objectives of Small-scale Industry Cell

5.0 These guidelines were given a concrete shape by adapting them as the broad objectives of the "Technical Information and Liaison Cell" for small-scale industries set up at the Council's headquarters.

5.1 The objectives of Information and Liaison Cell for Small-scale Industries are:

(i) to strengthen liaison and co-operation with small-scale industries and their organisations;

(ii) to assist in solving such of their technical problems for which facilities do not exist either with the industry or the Small Industry Service Institutes;

(iii) the Small Industry Service Institutes may act as a forum for channelling such complex problems between the Council and small-scale industries;

(iv) to compile information regarding research projects worked out by National Laboratories and Institutes which are of interest to small-scale industries;

(v) to entertain and deal with enquiries emenating from small-scale units, their associations and other bodies connected with these units.

(vi) to undertake collection, compilation and dissemination of technical information in co-operation with the associations of small-scale industries which may be of interest to small-scale industries.

Methodology of extending technical assistance

6.0 The actual methods of rendering assistance to small-scale industries are briefly explained hereunder with some illustrations:

The Council and the network of National Laboratories function as the aid-giving organisation. The recipient of the aid naturally is the small-scale industry. The normal channels for the flow of the aid are the Small Industries Service Institutes; the Federation of Associations of Small-scale Industries, the State Directorate of Industries, the Khadi and Village Industries Commission; the Project Officers of Rural Industrialisation Projects of the Planning Commission and other government or semi-government departments.

6.1 The assistance from the Council flows in two ways:

(i) providing solutions to problems sent by small-scale industries. These problems are received either directly from a small-scale unit or through any of the above-mentioned organisations. A list of the problems received is enclosed as Annex III.

(ii) publishing the results of the researches of the National Laboratories which are of interest to small-scale industries through various publications including those published by the Council.

6.2 Although the Council is mainly concerned with technical problems, all sorts of enquiries are entertained. Those which are non-technical in nature are disposed of by referring the matter to the appropriate organisations. Some specimens of the problems received by the Council for solution and the manner of their disposal are given in Annex IV.

6.3 An experiment in the "Get-together of Research and Industry"

With the object of stimulating the interest of industry in utilising the results of research done by the National Laboratories and outlining the work to be carried out by the research organisations with a view to attaining maximum self-sufficiency a "Get-together of Research and Industry" was organised by the DRCIL in December 1965. It was attended by about 1,000 delegates representing research institutions, private and public sector industries, government departments, etc. Subject-wise discussions took place in 15 separate working groups.

In addition to identifying the problems in different fields which need scientific investigations for solution, the "Get-together" meeting brought the industry and research workers closer to each other and created an atmosphere for intimate contacts and purposeful relationship between research and industry.

Services rendered

7.0 In fulfilment of the above objectives the publications of the Council explaining the functions of the National Laboratories and the nature of assistance they are capable of rendering were issued to all the Small Industry Organisations. This helped the industries to know about the Council and its activities.

7.1 A list of processes developed at National Laboratories which could be utilised by the small-scale industries was prepared. Some of these processes were also published in journals of the Small Industry Organisations. As a result of these several parties approached the Council to obtain further details about the process. They were given the necessary assistance through the concerned Laboratories.

7.2 The Council released the following compilations for the benefit of industry:

(i) Schedule of charges for testing and analysis jobs undertaken by the National Laboratories (1963).

(ii) Specialised instruments and equipment available with National Laboratories and Co-operative Research Associations.

The foreword of this publication reads as follows:

"The need for a reference source indicating specialised instruments and equipments available in the National Laboratories has been felt for a long time. Besides providing information on specialised items available in these institutions, it helps universities, industries, government agencies,etc.in seeking assistance direct from the nearest Laboratory (1965)."

(iii) Research Programmes of CSIR (1965)

This directory of research projects and schemes of the Council was compiled to serve as a source of information on research programmes in promotion of collaboration with other research organisations and industries.

(iv) A specially designed project note was worked out on a few selected processes developed by the Laboratories of the Council and suitable for small industries as per proforma enclosed (Annex V).

8.0 The "Information News Letter", a quarterly journal, was specially designed and brought out by the Council (Directorate of Research Co-ordination and Industrial Liaison) at the instance of the Central Small Scale Industries Organisation (CSIO) of the then Ministry of Commerce and Industry, Government of India, with the object of catering to the needs of small-scale industries. The bulletin had its prime objective to keep the Small Industries Service Institutes, small industrial units and similar other bodies posted with information regarding the work of the National Laboratories and to stimulate the interest of the small industries in the processes and products being evolved by CSIR Laboratories as a result of continuous scientific and technological research conducted by them.

The bulletin aroused interest amongst different organisations with a result that its circulation increased from 100 copies in May 1962 to 700 copies in October 1963 and 1500 copies in July 1964. Its present circulation is 1882 copies.

8.1 The Information News Letter covers the following borad aspects:

(i) a general note;

(ii) service to industry (giving data regarding services rendered by the CSIR laboratories/institutes to small industries and others);

(iii) laboratories news (a brief on the processes in production on pilot plant scale of the laboratories);

(iv) continued column, work on 'Import substitution"; research work on "Utilisation of Waste", are given under this head;

(v) processes for small-scale industries. It briefly describes the new processes, raw materials and cost estimates, etc.;

(vi) processes and products so far published, new processes/products evolved by the laboratories have been published under this head;

(vii) scientific notes and news. This covers items of interest from Laboratories, commissioning of plants, symposia, training courses, demonstrations, etc.;

(viii) commercial exploitation of the processes released by the Council - consultation service - details regarding processes released, consultation service rendered to industry, processes under negotiation and new processes referred to R&D are given under this.

8. There is no restriction on further reproduction of the information contained in this bulletin and renowned journals of India, viz. Chemical Age of India, Science and Engineering and Federation of Associations of Number of Commerce and Industries of India have reproduced materials published in the Information Wave Letter.

Technical Information Centre for Chemical Industry

Another development of significance is the establishment of "Technical Information Centres" with the financial and organisational participation by the trade associations of industry. In collaboration with the Indian Chemical Manufacturers' Association we have an active Centre to serve the chemical industry. The main activities of the Centre are as under:

(i) collection and compilation of information regarding chemical industry,

(ii) attending to enquiries,

(iii) arranging liaison meetings between the technical personnel of industry and scientists of Laboratories, and

(iv) visits to factories with a view to ascertaining their line of activity and problems, if any.

9.1 Another project entitled "Mid Industry Clinics" with the financial participation of the state governments and the local chamber of commerce and industry are proposed to be set up with the following functions:

(i) storage and dissemination of information on research work,

(ii) provide guidance and direction to industry, seeking technical assistance from specialised agencies and laboratories; and

(iii) collect information about the problems of the industry in the region and serve as feed-back to the research organisations.

9.2 A similar Centre for Instruments Industry is also planned to be set up.

9.3 As a consequence of these efforts, there has been an intensification of activity. There has been marked increase in the consultation and advisory service provided by the Council's Laboratories to industries and user organisations. This assistance and service includes taking up research work at their instance for solution of problems, collection of data, providing project report and feasibility reports, etc.

9.3.1 The number of consultancy services to industry including small industries on specific terms of payment during the last three years has been as under:

	[illegible]	[illegible]	[illegible]
Number of new consultancy services undertaken by laboratories	[illegible]	10	[illegible]

9.3.2 Similarly there has been a steady increase in availing of the facilities for testing, analysis and standardisation of raw materials and finished products and also repairs and calibration of instruments indicated by the figures given below:

	1964	1965
Number of samples tested/analysed	[illegible]	[illegible]

9.3.3 Enquiries regarding assistance are being regularly received from small-scale industries and their representative organisations on problems requiring research and investigation. These enquiries are scrutinised, processed and disposed of in either of the following two ways:

(i) disposing of with the readily available information

(ii) referring to National Laboratories for research and investigation.

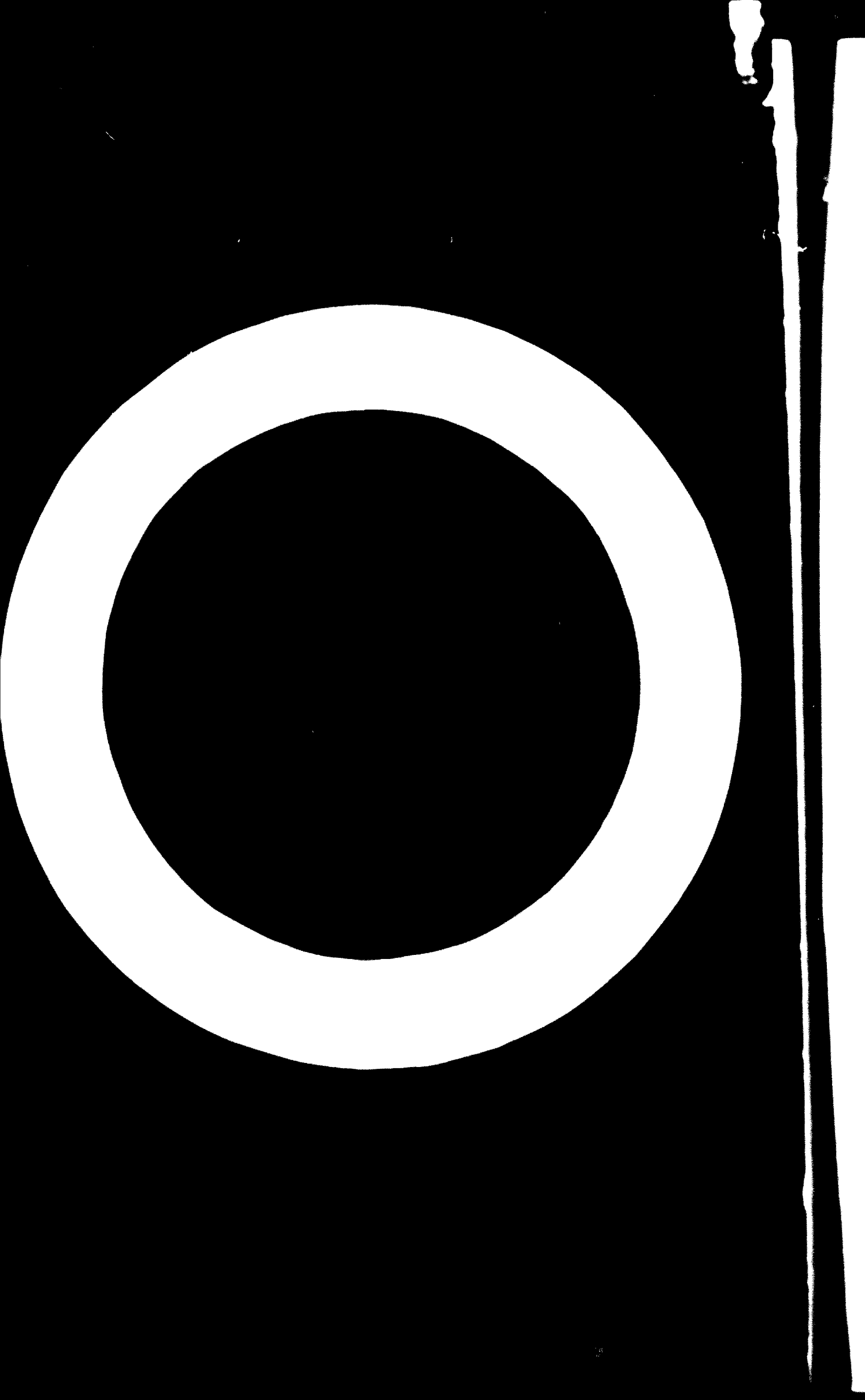
Sometimes, comprehensive notes comprising of technical data and information on processes, standards and products are supplied.

Enquiries from industries including small industries are also showing a rising trend:

	1964	1965
Number of enquiries received	[illegible]	[illegible]
Number of technical notes supplied	[illegible]	[illegible]

9.3.4 Every purposeful enquiry is followed up by the Small Industries Cell.

9.3.5 A few significant instances of the problems on which advice of the Council was sought during 1965-66 has already been given in Annex IV.



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List of [illegible] of [illegible]
directly or indirectly [illegible] all industries

1. National Chemical Laboratory, [illegible]
2. National Physical Laboratory, New Delhi
3. Central Glass and Ceramic Research Institute, Calcutta
4. Central Food Technological Research Institute, Mysore
5. National Metallurgical Laboratory, Jamshedpur
6. Central Drug Research Institute, Lucknow
7. Central Electrochemical Research Institute, Karaikudi
8. Central Leather Research Institute, Adyar
9. National Botanic Gardens, Lucknow
10. Central Electronics Engineering Research Institute, Pilani
11. Central Salt and Marine Chemicals Research Institute, Bhavnagar
12. National Research Laboratory, Hyderabad
13. Aeronautical Research Laboratory, Jorhat Road
14. Central Mechanical Engineering Research Institute, Durgapur
15. Central Scientific Instruments Organisation, Chandigarh
16. National Aeronautical Laboratory, Bangalore
17. Directorate of Research Co-ordination and Industrial Liaison, CSIR, New Delhi

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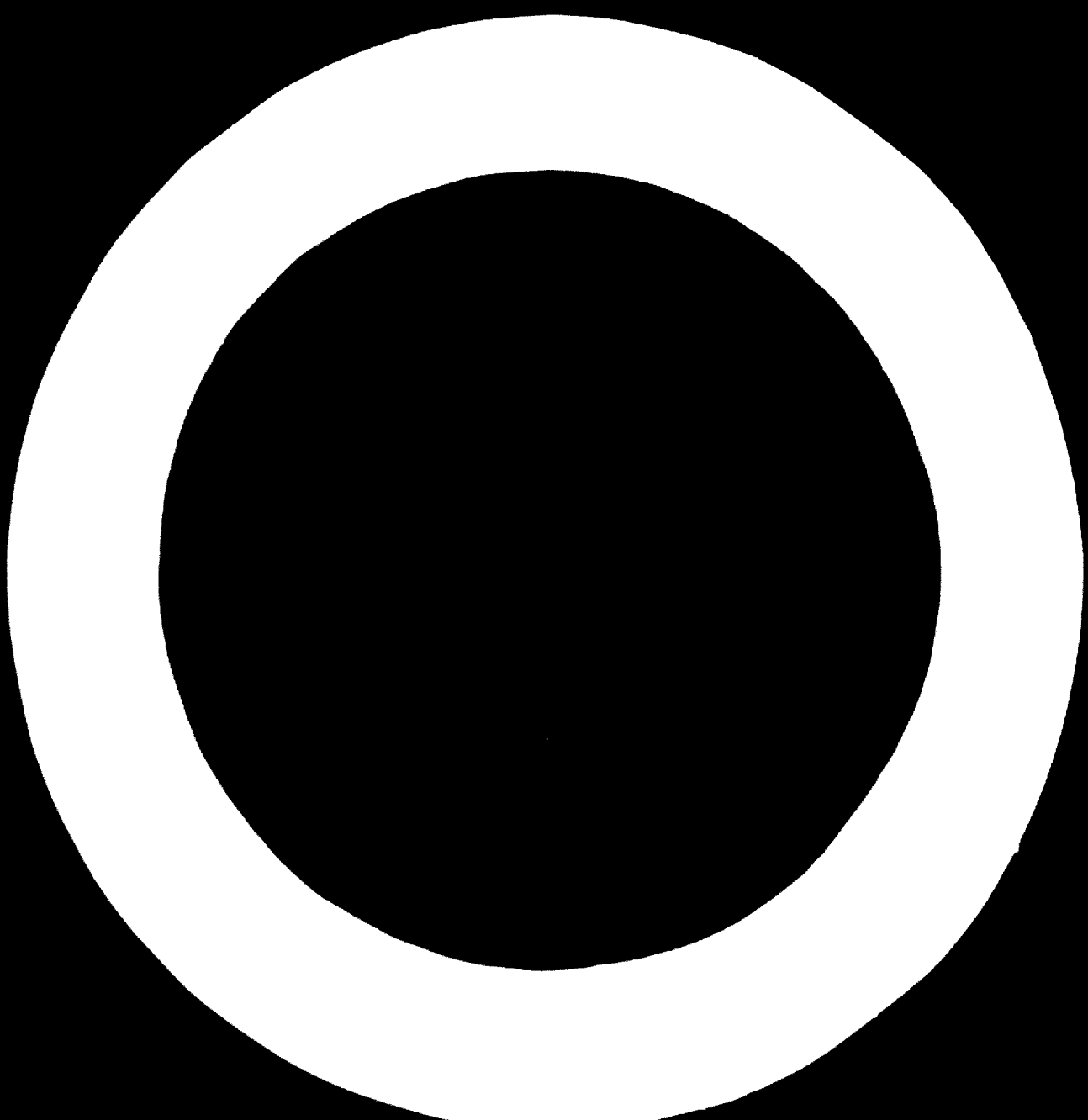


ANNEX II

Training and Refresher Courses conducted by
CSIR Laboratories during 1966

1. National Physical Laboratory, New Delhi:

   (i) Workshop practice
   (ii) Weights and measures
   (iii) Electronics

2. Central Glass and Ceramic Research Institute, Calcutta:

   (i) Training in optical glass working

3. Central Food Technological Research Institute, Mysore:

   (i) Training in fruit and vegetable preservation
   (ii) Durofume and related pest control processes
   (iii) Short-term course in fruit and vegetable technology
   (iv) Short-term course in infestation control in raw and processed foods
   (v) Short-term course on problems of rural storage
   (vi) Short-term course in meat, fish and poultry technology

4. National Metallurgical Laboratory, Jamshedpur:

   (i) General metallurgy

5. Central Electro-Chemical Research Institute, Karaikudi:

   (i) Refresher course on "Storage Battery"
   (ii) Course on "Corrosion and its prevention"
   (iii) Refresher course in "Electroplating"

6. Central Leather Research Institute, Madras:

   (i) Refresher course in leather processing

7. National Botanic Gardens, Lucknow:

   (i) Processing of non-edible oils

8. Centr l lectronics En i eerin es r Institute, :

   (i) Summer School in electronic control

9. Centr l alt and rine Chemic ls Research Institute,

   (i) uality control of s lt

10. Regi n l Rese rch L oratory, J mm :

   (i) Fruit and veget le preserv tion

11. Centr l cientific Inst ments Or is tion, Chandi :

   (i) Testing and use of o tic l i struments

   (ii) Electronic instrument tion

12. Centr l Public Healt Engineerin Rese rch Institute,

   (i) Refres er courses in ater r sources nd treatment

- - - -

Services rendered to small [illegible]

Commercial enquiries

[illegible] R. [illegible] [illegible] are [illegible] electronic equipment. They approached the Council for the [illegible] manufacture of printed circuits and allied electronics equipment.

Since the enquiry involved technical know-how, the Director, Central Electronics Engineering Research Institute, Pilani (CEERI) was consulted in the matter. The party was supplied with the following information:

Printed circuit boards are [illegible] from [illegible] [illegible] dealers, which are manufactured by the following two firms:

1. M/s [illegible] Ltd.,
   Industrial [illegible] to
   [illegible], [illegible]

2. M/s [illegible] India Ltd.,
   [illegible] Box No. [illegible]
   [illegible]

The circuit designing is one of the [illegible] [illegible] of the whole process and most of the process is that of selective photo exposure under some photo resist material which is being imported at present by M/s Kodak Ltd., under the trade name of Kodak [illegible]. There is every possibility of photo resist material being indigenously manufactured [illegible] [illegible] in the near future. [illegible] of scientific laboratories [illegible] [illegible] [illegible] the process or the manufacture of [illegible] it needs industrial exploitation.

The party [illegible] also informed that extensive facilities are available at CEERI for making printed circuits and they may visit the Institute at their convenience.

The [illegible] [illegible] followed up with the laboratory and the party till they were fully convinced with their requirements.

[illegible] enquiries

M/s R. C. [illegible] of [illegible] [illegible] [illegible] [illegible] installed [illegible] manufacturing unit for [illegible] from coconuts and oil from the inner shell of coconuts [illegible] [illegible] us for the following assistance:

(i) [illegible]ossible uses of saponins [illegible] so[illegible]nut oil [illegible] industries which use these [illegible]roducts.

(ii) [illegible]esting their samples and [illegible] for further improvement of their [illegible]lity.

The following [illegible] tion w[illegible] lied to the [illegible]rty:

Saponins: [illegible]e triterpenoid saponins obtained from soapnut are powerful foaming [illegible] They are used [illegible], emulsifiers of oil [illegible] poisons for cold-blooded animals. They are used as foaming agents in beverages (cold drinks, beer) industry, as emulsifying agents to emulsify fixed oils and resins for fruit tree sprays, in the manufacture of acoustic tiles, photographic [illegible], films and [illegible], ceramics, foam fire extinguishers, tooth paste, shampoos, liquid soaps in cosmetic preparation. They are also used for poisoning fish, for washing wool and silk and for killing insects in [illegible]. The above industries could be contacted for further information.

Soapnut oil: The kernel contains 45 per cent oil which is light coloured. The oil has the following characteristics: refractive Index at 25°C, 1.4664; acid value, [illegible].9; iodine value 70, and saponification equivalent, 300. The fatty acid composition is as follows: palmitic, 5.4; stearic [illegible].5, arachidic [illegible].7, behenic [illegible].1, oleic 55.1 and linoleic [illegible] (wt.) per cent. The unsaponifiable matter of oil is 1.2 per cent. From the fatty acid composition, one could [illegible] that oil could be used in soap manufacture, fatty acid industry, in [illegible] candles and greases. The oil is [illegible] arachidic acid, [illegible] does not [illegible] industrial use [illegible] present. Because [illegible] in [illegible] less digestible, it may not be a good edible fat.

[illegible] the party [illegible] given six [illegible] names of manufacturers of shampoo, [illegible] etc, etc., from whom they could get further information about the market of their product.

[illegible] testing of samples, the party was advised to contact the Director, [illegible] Laboratory, [illegible].

The party got their samples tested by the laboratory, who also supplied them with useful reference literature on the subject.

An example to show how a process developed in one of the National Laboratories is passed on in different stages to small-scale industries:

A process on "Particle Board from wood waste without binders" was developed at Regional Research Laboratory, Jorhat, Assam. The process utilizes low-grade wastes like saw dust, rice-husk, bagasse, rud grass, etc. Also since it uses water as the only binder it ensures saving of foreign exchange by eliminating the use of resins which are imported.

Since it was a process suitable for small-scale industries, necessary details on the process were circulated.

A number of entrepreneurs showed interest in the process and wrote to the Council for releasing the know-how.

To ascertain favourable response the terms and conditions for releasing the know-how were settled as under:

1.	Lumpsum advance/deposit/fee to the Council for obtaining know-how	Rs. 5,000
2.	Recurring royalty	2 1/2% on ex-factory sale price
3.	Nature of licence	Non-exclusive
4.	Period of licence	10 years

These were made known to the National Research Development Corporation of India (NRDC) and the parties were put in touch with the aforesaid organisation for obtaining the know-how after completing the necessary formalities.

Before NRDC enters into any agreement with a party for releasing the know-how it will supply technical note and cost estimates to the party and ask them to visit the concerned National Laboratory and the scientists who have invented the process for discussions and clarification on any point necessary to enable him to make up his mind about taking up commercial exploitation of the process. When the party is fully satisfied about the commercial viability of the process, licence is issued.

Two parties are negotiating with NRDC for obtaining the know-how.

Another example of extension of the results of researches carried out at the National Laboratories to small-scale industries: Release of know-how for Television Receivers:

The Central Electronics Engineering Research Institute, Pilani, an Institute under the Council, has developed the know-how for the manufacture of TV sets. The manufacture of TV sets, components and its assembly is a costly affair and in general beyond the technological competence of an individual small-scale unit. But there are many small units in the electronics field which have competence and experience in the manufacture of sophisticated components. In view of the fact that most of the components required for TV and the assembly of TV sets can be manufactured by small-scale units, it was decided that the know-how will be released not to any individual unit but to a number of units who will come together and form a sort of consortium by pooling their resources and capabilities and drawing a common programme of manufacture.

The idea has been widely acclaimed by the small industries as well as the Ministry of Industry and already several consortiums are under formation. The Government is already favourably considering the case of one such consortium at present. The Federation of Associations of Small Industries of India (F.A.S.I.I.) has been entrusted by the Government to scrutinise and recommend the applications of small-scale industries for manufacture of television receivers.

A similar project on low cost radio receiver is also under negotiation with the Federation of the Associations of Small Industries of India.

Another typical case:

The Ministry of Industry got a large number of applications from bucket manufacturers to allot them additional quota of zinc which is used by them for galvanising. Since zinc is a scarce raw material in India it was not possible for the Government of India to allot the entire quantity. The question was referred to the Council for suggesting an alternative product.

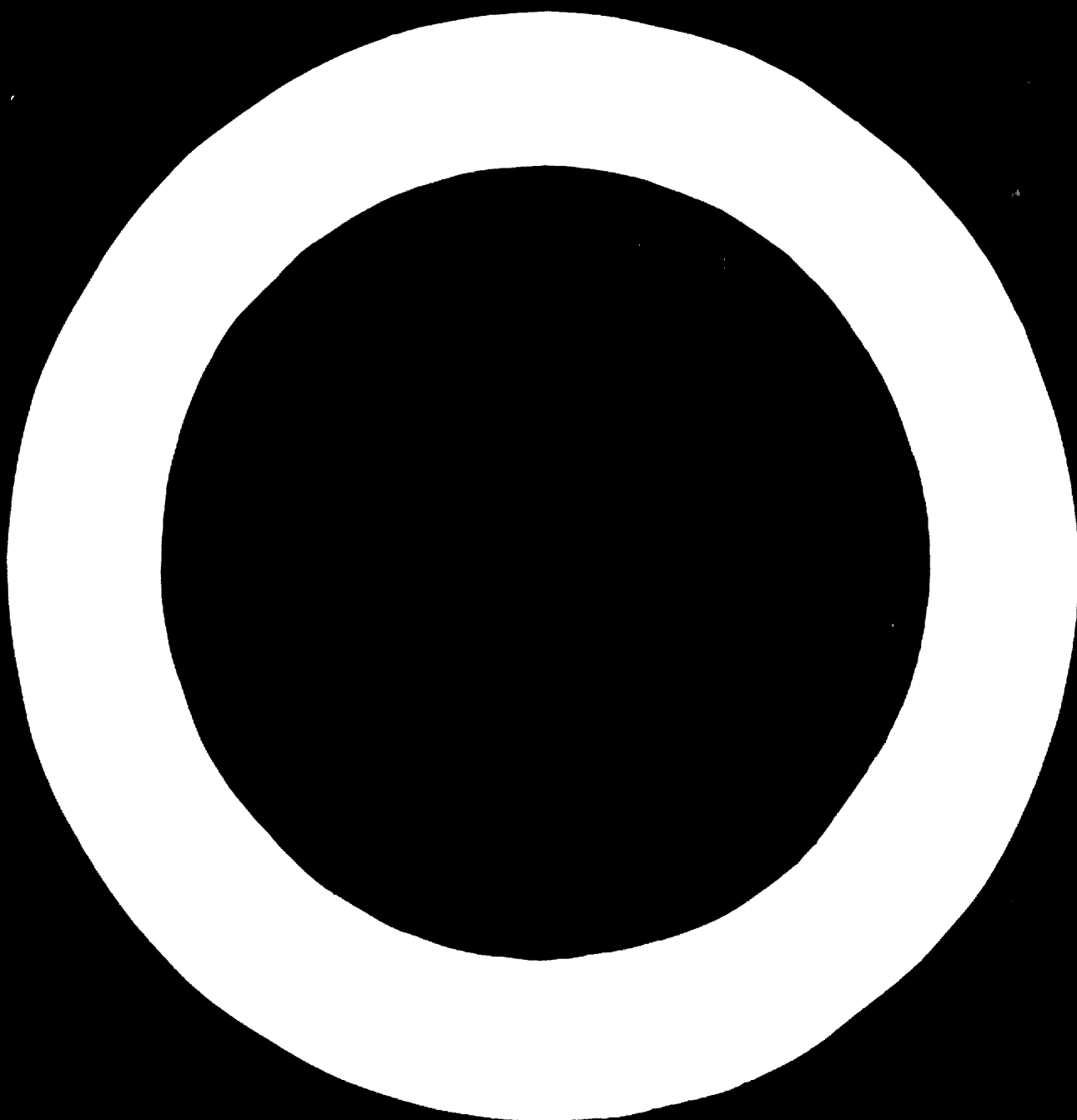
The National Metallurgical Laboratory, Jamshedpur (NML) developed the process of aluminising which substitutes zinc requirements. The Ministry of Industry and the Bucket Manufacturers Association of India were informed on the following lines:

> "The interested bucket manufacturers may be advised to contact the National Research Development Corporation of India (NRDC) for release of know-how on the 'hot dip aluminizing of ferrous material'. As a special case the small industries will be required to make any payment for this licence only after a full practical demonstration and training in the process

was given to them. The industry's representatives deputed for training will also be helped in making a few sample buckets in the laboratory on nominal fees."

The bucket manufacturers are now in touch with the NRDC and NSIL for their requirement.

The Council has made a list of interested parties and is following up the matter.



R[illegible]T

1. Name of the project/process. Patent Nos., etc.
2. Name of the Laboratory/Institute
3. Capital outlay required for the project
4. Novel Features:

   (i) dvantages over the existing process
   (ii) Reduction in cost
   (iii) Indigenous development or import substitution
   (iv) Utilization of by-product and waste, if any
   (v) Comparative properties of the finished product obtained with those of the imported

5. Scope of utilization:

   (i) resent demand of the country
   (ii) Requirement in the next Five-Year Plan
   (iii) Import or export, if any
   (iv) Existing units, their capacity and production
   (v) Further scope of its application

6. Basic requirements:

   (i) Patented or non-patented
   (ii) To be released against royalties/premium (state terms)
   (iii) Special precautions for health hazard, etc.

7. State of Laboratory work:

   The present stage of the process - Laboratory scale/pilot plant scale

   (i) The scale and period of continuous operation of pilot plant or number of trials run
   (ii) Size of minimum economic unit (on output basis)

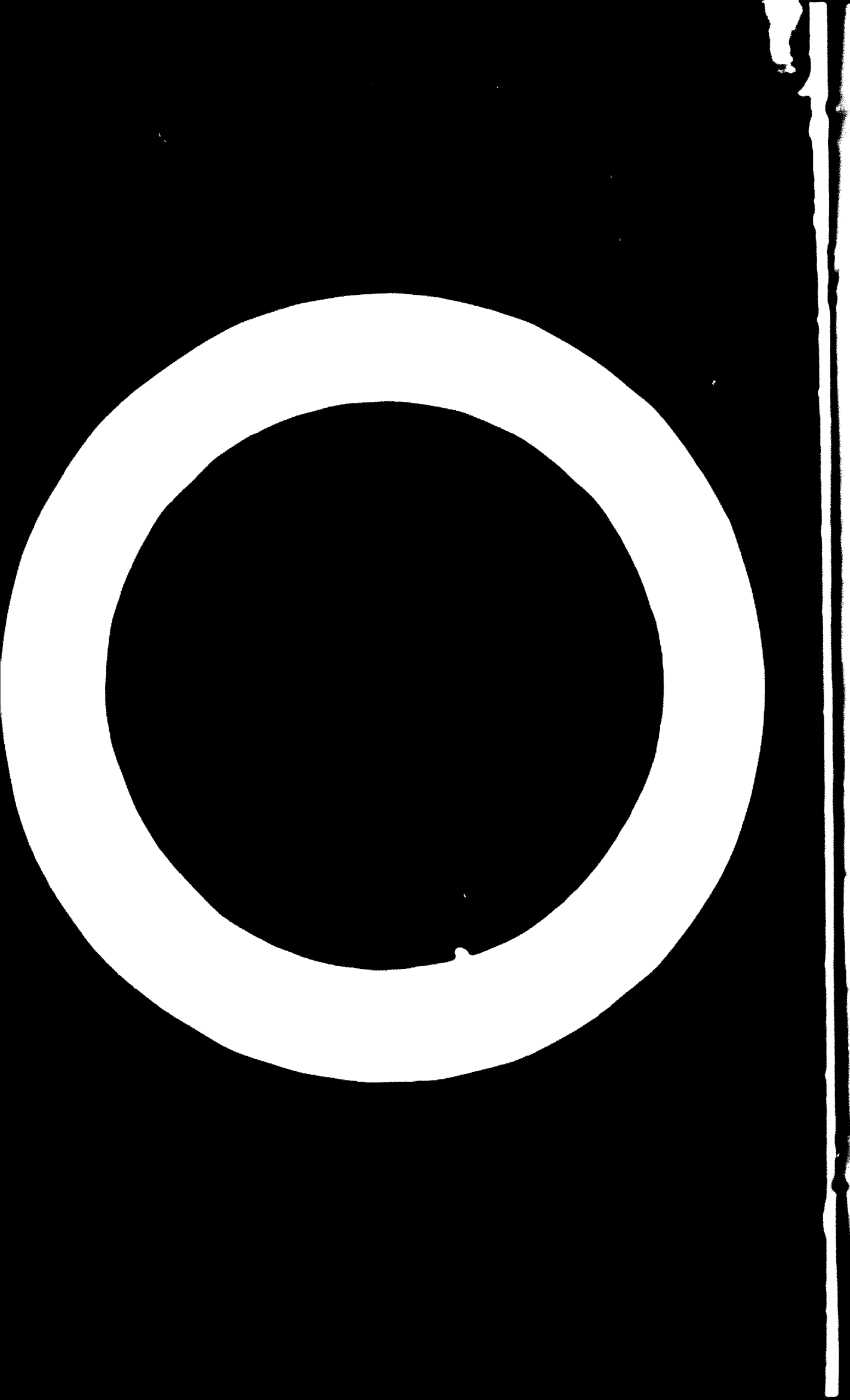
8. Market survey report (state result)

9. Specifications for finished product. Yield of the finished product in percentage.

10. Availability of raw materials in India with specifications and source. Foreign exchange component for raw material in case not available indigenously.

11. Availability of machinery and equipment in India with specifications and sources. Foreign exchange component in case of imported items.

12. Description of the process including flow-sheet, sketches, designs, etc.



13. [illegible]

14. Effluent problems, if any, and the methods of its treatment.

15. **Labour:**

To indicate the requirement of direct and indirect labour separately under the following heads:

(i) [illegible]
(ii) [illegible] required under each [illegible]

16. **Economics of the process:**

This should include:

I. A. Total capital investment consisting of:

1. Cost of plant
2. Cost of auxiliaries and accessories
3. Transportation to the plant
4. Land and development
5. Civil engineering works
6. Water requirement and arrangements
7. Training
8. Colony for the workers and staff
9. Welfare facilities

B. Erection and supervision at 15 per cent of cost of plant and equipment.

C. Working capital:

This will include the cost on the following items for 3 months:

1. Raw material
2. Direct labour
3. Indirect labour
4. Depreciation
5. Office supplies
6. Power
7. Water
8. Fuel
9. Selling and trading cost

Total investment A + B + C

II. The cost of production should include:

A. Direct costs like:

1. Raw materials
2. Utilities
3. Maintenance
4. Labour

B. Indirect costs like:

1. Depreciation
2. Interest on the capital
3. Taxes
4. Overheads, etc.

which works to about 70 per cent on [illegible] capital.

C. [illegible] on by-products, if any.

D. Costs of production, ex-works.

E. Costs of product with 10 per cent profit on the investment.

17. [illegible]:

This will include costs on the following:

1. Interest on loans
2. Insurance
3. Local costs
4. Utility costs
5. Unforeseen expenses

18. Points requiring specific emphasis.

19. Training and demonstration facilities available.

20. Any other information not covered above.

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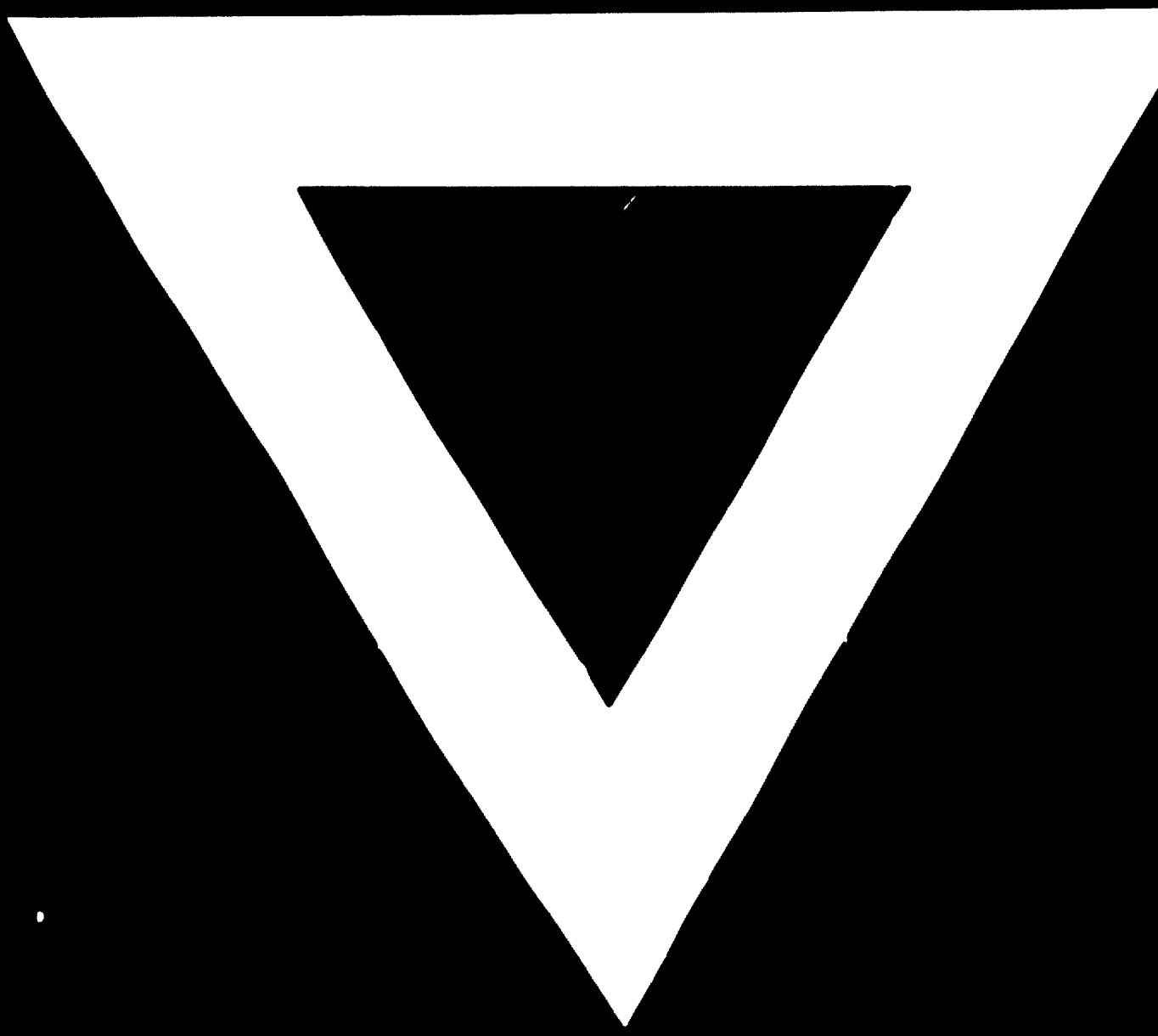

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