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Directory: Institutes of Industrial Research and Technology in Israel

Name and address of research institute	Name and designation of head of the institute	Functions	Governing body	Publications
<p>Authority for Research and Development of the Hebrew University of Jerusalem, Jerusalem, University Campus</p>	<p>Prof. J. Gross, Chairman</p>	<p>Founded 1959. Initiates and co-ordinates research projects carried out at the Hebrew University of Jerusalem. Negotiates and is responsible for contracts with Government, private and public agencies in Israel and abroad; is concerned with obtaining and maintaining necessary interdepartmental equipment facilities, and with introduction of new fields of research.</p>	<p>16 representatives from the various faculties of the University, appointed by the President of the University and including <i>ex officio</i> the President and the Rector.</p>	<p>Internal research reports arising from contracts.</p>
<p>Braverman Citrus Products Research Laboratory, Rehovot, P.O.B. 501</p>	<p>Mr. H. B. Basker, Director</p>	<p>Founded 1947 to carry out research in the technology of citrus products and preserves.</p>	<p>Citrus and Canned Products Association.</p>	
<p>Building Center, Haifa, P.O.B. 4932</p>	<p>Mr. A. Papper, Director</p>	<p>Founded 1960 as permanent exhibition of building materials and engineering products. Operates a documentation unit to provide information service in building, architecture and town planning, and holds symposia on these subjects.</p>	<p>Association of Engineers and Architects in Israel.</p>	<ol style="list-style-type: none"> 1. Contents pages of periodicals on building and architecture, monthly. 2. Information leaflet (Hebrew), bi-monthly (contains, <i>inter alia</i>, abstracts in original language of publication). 3. Bibliographies, irregular (items listed in original language). 4. Proceedings of symposia organized by the Center (Hebrew).
<p>Food Industries Advisory Service, Tel Aviv, 1 Peretz St.</p>	<p>Dr. S. Lichtblau, Director</p>	<p>Founded 1959 to give advice to local food industry, to aid in product development, and to gather and channel information for interested parties.</p>	<p>Ministry of Commerce and Industry; United States Aid Mission to Israel; Manufacturers Association of Israel (sponsors).</p>	

<i>Name and address of research institute</i>	<i>Name and designation of head of the institute</i>	<i>Functions</i>	<i>Governing body</i>	<i>Publications</i>
Institute for Fibres and Forest Products Research, Jerusalem, P.O.B. 8001	Dr. M. Lewin, Director	Founded 1953 to carry out research in the fields of fibres, textile, wood, paper and cellulose chemistry and technology, textile plants, leather industry and detergents.	Ministry of Commerce and Industry	<ol style="list-style-type: none"> 1. Papers in various scientific and technical journals. 2. Yalkut, Bulletin for fibres and textile technology (Hebrew), bi-monthly. 3. Contents pages of periodicals on textiles, monthly (published jointly with the Center of Scientific and Technological Information). 4. Research reports.
Institute for Standardization and Control of Pharmaceuticals, Jerusalem, Russian Compound	Dr. E. Weisenberg, Director	Founded 1953. Carries out chemical, microbiological, pharmacological and toxicological tests of drugs for export and for local use, standardization of biological drugs and chemical and toxicological tests of food, food additives, cosmetics and pesticides.	Ministry of Health	<ol style="list-style-type: none"> 1. Research studies.
Israel Ceramic and Silicate Institute, Haifa, Technion City	Dr. H. Turnauer, Director	Founded 1962. United Nations Special Fund Project to broaden the scope of technical assistance to the Israel ceramic industry and conduct research in cement, glass, enamels, new uses of inorganic, and non-ferrous materials, solid state physics, physical chemistry and microstructures, with emphasis on development of local raw materials.	Governing Board, comprising representatives of the industry, the Ministry of Development, the Prime Minister's Office, National Council for Research and Development, the Technion-Israel Institute of Technology, and the Ceramic Research Association of Israel.	<ol style="list-style-type: none"> 1. Contents pages of periodicals on ceramics, glass, cement and enamel (Hebrew), monthly (published jointly with the Center of Scientific and Technological Information). 2. Alon, bulletin (Hebrew), irregular.
Israel Institute of Metals and Mechanical Testing Laboratory, Haifa, Technion City	Mr. S. Goldschmidt, Director	Founded 1963 through merger of the Israel Institute of Metals (founded 1957) and the Mechanical Testing Laboratory (founded 1953) to co-ordinate research, testing, instruction and dissemination of knowledge in the field.	Board of Directors comprising representatives of the Technion-Israel Institute of Technology, the Technion Research and Development Foundation Ltd., the Ministry of Commerce and Industry, the Standards Institution of Israel, the Artisan and Small Industry Association and representatives of industry.	<ol style="list-style-type: none"> 1. Matekhet (Hebrew), quarterly. 2. Contents pages of periodicals on metals, monthly (published jointly with the Center of Scientific and Technological Information).

<i>Name and address of research institute</i>	<i>Name and designation of head of the institute</i>	<i>Functions</i>	<i>Governing body</i>	<i>Publications</i>
Israel Institute of Packaging and Industrial Design, Tel Aviv, Bet Ma' ariv, 2 Carlebach St.	Mr. Y. Schatzov, Director	Founded 1964 as a public non-profit organization by the Israel Government—represented through the Ministry of Commerce and Industry, the Technion-Israel Institute of Technology and the Manufacturers Association of Israel. Aims to raise standards of packaging and design of industrial products in Israel. Serves as technical information center—provides documentation services, organizes courses, lectures, meetings, exhibitions and competitions. Maintains experimental laboratories and workshops.	Board of Directors comprising appointed representatives of the three founding members and elected representatives of members.	1. Leqet yedi'ot (News digest) (Hebrew), quarterly. 2. Israel Design, quarterly. 3. Contents pages of periodicals on packaging and industrial design, monthly (published jointly with the Center of Scientific and Technological Information).
Israel Institute of Productivity, Tel Aviv, 4 Henrietta Szold St.	Mr. I. Meidan, Director	Founded 1951. Conducts surveys and research projects in various branches of industry, building trades, agriculture and services. Carries out pilot projects, advises enterprises on methods to increase productivity, holds training courses and lectures for industrial employees and the general public.	Board of Directors, comprising representatives of the Ministries of Labour, of Finance, and of Commerce and Industry, the General Federation of Labour in Israel, the Manufacturers Association of Israel, the Association of Engineers and Architects in Israel and the Technion-Israel Institute of Technology.	1. Halmifal (Enterprise) (Hebrew), monthly. 2. Pamphlets for industrial workers (Hebrew), monthly. 3. News from the institute (Hebrew), bi-monthly. 4. Productivity in Israel, quarterly. 5. Reports, surveys and research reports. Co-publishers of: 6. Organization and Administration, bi-monthly. 7. Tamhir (cost accounting) (Hebrew), quarterly. 8. Charoshet Umelacha (industry and handicrafts) (Hebrew), monthly. 9. Automation (Hebrew), bi-monthly. Interim and final research reports.
Israel Mining Industries—Institute for Research and Development, Haifa, P.O.B. 313	Dr. A. Baniel, Director	Founded 1951. Carries out applied chemical research and process development. Covers the fields of physical, inorganic and organic chemistry. Engages in unit operations, physical separation, mineral dressing and beneficiation, metal extraction, high analysis fertilizer products, organic bromine compounds, costing and economic evaluation.	Board of Directors, comprising representatives of the Ministry of Defence, Ministry of Development, the Technion-Israel Institute of Technology, industrial development enterprises and banking institutions.	

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Israel Wine Institute Ltd., Rehovot, P.O.B. 529	Mr. E. Ezrahi, Director	<p>Maintains analytical laboratories, pilot plants and a documentation center. Undertakes work assignments under contract.</p> <p>Founded 1957 to improve the country's wine and to further its export.</p> <p>Studies wine and brandy technology, especially aging problems, carries out quality control, conducts market research and participates in international exhibitions.</p>	Board of Directors, comprising wine producers and representatives of the Ministries of Agriculture, Commerce and Industry, and Finance.	
National Physical Laboratory of Israel, Jerusalem, University Campus	Dr. H. Z. Tabor, Director	<p>Founded 1950. Carries out research in applied physical sciences, especially energy conversion—mainly solar energy utilization, applied thermodynamics and medical engineering.</p> <p>Maintains a basic physical standards laboratory for precision measurement and calibration.</p>	Prime Minister's Office, National Council for Research and Development.	
Paint Research Association Ltd., Haifa, Technion City	Mr. B. F. Munk, Director of Laboratory	<p>Founded 1960 by Ministry of Commerce and Industry, Prime Minister's Office, National Council for Research and Development, Technion-Israel Institute of Technology and the Israel paint and ink industry.</p> <p>Aims to raise and establish quality of local raw materials for the Israel paint industry, improve the final products and aid in their standardization.</p> <p>Encourages development and application of new raw materials.</p> <p>Maintains laboratory for basic applied research and control testing, gives professional advice to chemists and technicians and holds meetings, <i>inter alia</i>, for demonstration of new methods.</p>	Managing Board, comprising representatives of paint industry, Ministry of Commerce and Industry, Prime Minister's Office, National Council for Research and Development and Technion-Israel Institute of Technology.	

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Rubber Research Association Ltd., Haifa, Technion City	Mr. E. Haim, Head of Laboratory	Founded 1951 by the Ministry of Commerce and Industry, the Prime Minister's Office, National Council for Research and Development and Israel rubber manufacturers, to engage in activities for the advancement of the rubber industry in Israel. Maintains laboratories to carry out research, experiments and tests in rubber, plastics and related fields.	Managing Board, comprising representatives of the rubber industry, the Ministry of Commerce and Industry, the Ministry of Defence, the Ministry of Transport and Communications and the Prime Minister's Office, National Council for Research and Development.	Bulletin to members and friends, monthly.
Standards Institution of Israel (S.I.I.), Tel Aviv, Ramat Aviv, Bene Yisrael St.	Mr. F. Hadass, Director	Founded 1945 as Standards Institution of Palestine and re-established under present name in 1953. Prepares and publishes standards, specifications, testing methods, etc., tests compliance of commodities with the requirements of Israeli and foreign standards; issues permits to manufacturers to affix the Standards Mark to their products; carries out technical research for purpose of standardization, establishing of testing methods, raising quality of industrial products, application of local raw materials and exploitation of industrial by-products. Maintains contacts and exchanges standards with national standards institutions in 53 countries.	Minister of Commerce and Industry responsible for implementation of the Standards Law; Board of Governors of about 40 members, comprising representatives of Government departments, public institutions, institutions of higher learning, municipal authorities, industry, building trade and commerce.	Israeli standards
Technion Research and Development Foundation Ltd., Haifa, Technion City	Prof. J. Karni, Director	Founded 1952 to carry out research in all fields of science and technology, including chemistry, physics, mathematics, building industries, food technology, hydraulics and aeronautics; chemical, electrical, mechanical, highway, soil, mineral, and sanitary and industrial management engineering. Research projects are carried out, materials and products tested, and consultation provided for the benefit of industry and any other interested body, by the staffs of the Technion-Israel Institute of Technology and of the Foundation.	Board of Directors, elected annually. Chairman of the Board is the President of the Technion-Israel Institute of Technology.	<ol style="list-style-type: none"> 1. In the field of building (Hebrew), ten issues <i>per annum</i>. 2. Building research, station research papers, irregular. 3. Interim and final research reports.

British Columbia Research Council, Vancouver, Canada

By P. C. Trussell, Director

Introduction

The British Columbia Research Council was established in 1944 as an outgrowth of the War Metals Board which operated during World War II. During the war the group had carried out experimental work on problems concerned with metallurgy and the physical chemistry of metals. This work was performed in laboratories located in a temporary wooden structure which, after 31 May 1944, became the first accommodation for the new industrial research institute.

Organization

The British Columbia Scientific and Industrial Research Council, later shortened to the British Columbia Research Council (BCRC), was incorporated under the Societies Act of the Province of British Columbia, with its own Board of Management. Although BCRC relied completely during its formative years on the Government of British Columbia for financing, the only link it was to have with the Government, both by constitution and in practice, was through the Minister of Trade and Industry, who was designated as Chairman of the Board of Management. The remaining members of the Board, totalling twenty in all, comprised three representatives from the University of British Columbia, two from Provincial Government technical service, two from Federal Government technical service, one from labour and the remainder from industry.

Board members are appointed for three-year terms, and each member may serve two consecutive terms for a total of six years. The Board concerns itself with the broad policies of the Research Council, and leaves wide power to the Director in the managing of the administrative and technical staffs of the laboratories. In this way, the responsibility for the functioning of the offices and laboratories is definitely set upon the shoulders of the Technical Director in exchange for the freedom to act and make decisions at the technical level.

In setting up the Research Council, provision was made for undertaking testing, engineering service and research work for industrial sponsors on a contract basis. Except in special instances, the client paid the full cost of the work undertaken; the results of the study were treated confidentially and became the client's sole property.

Technical divisions of physics, chemistry, engineering and applied biology were first established, and later, sections on operations research and market and feasibility studies. From the outset, a Technical Information Service was established.¹ This answered technical inquiries submitted by telephone or by letter, and provided a contact man who visited the industrial operations in the province, both large and small, seeking suggestions as to ways the Research Council might be of assistance to them. Later,

the Technical Information Service was combined with that provided by the National Research Council at Ottawa, and for many years now the cost of this service has been shared between the two agencies.

Research management

During the first five to ten years, most of the technical activity of the Research Council was in the area of technical and physical testing and engineering service. The Canadian Standards Association granted authority to the Research Council to test and approve electrical equipment as a service to local industry, and later, Canadian Gas Association followed. In the course of time, local commercial testing laboratories acquired expanded facilities and equipment, and by degrees much of the sophisticated chemical testing done at the Research Council passed to the commercial laboratories.

As the testing and service work demand was met by commercial laboratories and engineering firms, the Research Council took a stronger role in industrial research, usually starting areas of technical competence through "in-house" programmes financed from its annual grant from the Government of British Columbia. The first area of competence established was that relating to the control of odour and atmospheric pollution from kraft pulp mills, undertaken by the Division of Chemistry.

One of the critical problems facing the logging industry on the coast of British Columbia in 1949 and 1950 was the destruction by marine borers of sawmill and pulp mill logs in the sea during storage and transport to the mills. This problem was attacked by the Division of Applied Biology, and methods for controlling the damage were developed. Later, some of these methods were applied to protect a variety of marine installations on the Pacific Coast, including the interiors of floating wooden dry docks.

¹ See the article which follows.



Headquarters of the British Columbia Research Council, Vancouver, B.C.

¹ See also *Industrial Research News* (United Nations publication, Sales No.: 66.II.B.15), vol. 1, No. 2, June 1966, p. 42.

types of floats used by the logging, oil and ferry companies, and a variety of wooden marine structures.

Further developments in this field led to the design of a device and method for the determination of marine-borer damage in wharf piling, the development of impregnants for permanent protection of wood, and an underwater coating for application to structures already in place. The practical results derived from the application of these studies are worth to the maritime industries on the west coast of Canada and the United States between \$US 1 and 2 million annually in savings against marine-borer damage.

Another programme initiated by in-house studies and Council financing has been that of the use of bacteria for oxidizing sulfide ores to bring metals such as copper, zinc, nickel and uranium into solution, as an economic and practical means of recovering these metals from 10w-grade deposits. Similar to a number of other areas of specialized research effort, this programme was nurtured by the Council through the difficult phase when its commercial value was in question. When the probability of commercial usefulness improved, the interest of private industry was aroused, and financing was provided by mining companies which hoped to benefit by the newly described processes. This pattern of Government assistance to the point of assured commercial possibility, followed by industry participation in more extensive financing, has been repeated many times and lies behind the Council's success in many areas of applied research.

One feature of the above system has been to restrict the selection of projects to those of value to the industrial development of the area primarily served by the research institute, in our case, the Province of British Columbia. Even though private firms throughout the world may wish to participate in the financing of research programmes, and thereby derive benefit, projects still must be of local industrial significance. This technique in operation can purposefully be applied by research institutes in areas in which limited development of secondary industry has taken place.

It has been our experience that one of the most important underlying principles of our development has been the *judicious selection* of programmes for in-house research. The worth of these programmes must be periodically scrutinized and evaluated, otherwise substantial loss of the institute's resources, both in time and money, will occur. Certainly not all programmes initiated will be fruitful, but weak ones must be eliminated as rapidly as possible and the funds diverted to those having more promising possibilities of eventual commercialization.

Patents

Patents that have been granted cover the areas of marine-borer control, atmospheric pollution control, particularly in reference to kraft pulp mills, and equipment and process of a fuel log machine. Patent applications pending include an underwater protective coating and a number of discoveries on the biological leaching of ores.

Staff

The over-all staff of 87 is divided into three categories: administrative staff, including the Director, 11; technical staff, 68; and supporting staff, 8. The technical staff are directly engaged in research work. Of these, 18 per cent

are at the senior level and hold Ph.D.'s or equivalents; 34 per cent are at the intermediate level, holding Ph.D., M.S. and Bachelor degrees; and 48 per cent are at the junior level, holding Bachelor degrees or graduate certificates from technical schools.

Financial status

During 1965, BCRC conducted a research effort of \$US 1.1 million. Seventy per cent of this revenue was obtained from sponsored research; 26 per cent from Government grants; and 4 per cent from other sources. The sources of the sponsored research funds were 74 per cent from industrial contracts, 12 per cent from Government contracts (mainly Federal Government) and 14 per cent from research grants (mainly from institutions or branches of Government). The geographic distribution of contract income during 1965 was 41 per cent from British Columbia; 17 per cent from other parts of Canada; and 42 per cent from foreign countries.

Library and publications

BCRC has a technical library of 2 900 books, 205 periodical subscriptions, 32 indices and a number of Government publications. The collection is specially strong in the following subject areas: operation research, air and water pollution, wood preservation, marine borers, microbiological leaching of ores and corrosion.

A large number of publications have been issued covering the various research projects undertaken by BCRC. In addition, a monthly news-sheet, *Guidelines to Industrial Progress*, includes information on the Council's current research and development projects, as well as on other closely related matters.

Kraft Pulp Odour Control

**By F. E. Murray, Head, Division of Applied Chemistry,
British Columbia Research Council,
Vancouver, Canada**

Throughout the world, people are becoming more militant in their concern about air pollution in general. Vigorous protests have been directed against kraft pulp mills in particular, because of the obnoxious sulfide odours which they release and which occasionally present a nuisance at distances as great as 30 to 40 miles from the mill site. As a result of this rising public indignation, mill operators are now making a sincere effort to cope with the problem.

The British Columbia Research Council has developed a system for the control of this odour emission (*Figure 1*), which is based on a combined use of black liquor oxidation and two-stage scrubbing of non-condensable gases. Black liquor from the digesters is oxidized in a packed tower to convert the sulfide ion present in the liquor to sodium thiosulfate. In this way, the emission of hydrogen sulfide during evaporation of the liquor is almost eliminated.

Gases containing malodorous organic sulfides emitted from the digester blow and relief and from multiple effect

evaporators are passed with the air stream through the black liquor oxidation towers. In the oxidation towers, the hydrogen sulfide and the methyl mercaptan in these gases is absorbed and oxidized in the alkaline black liquor.

The gases emanating from the oxidation tower are passed through a two-stage scrubbing unit. In the first scrubber stage the odorous methyl sulfide and methyl disulfide gases present in the exhaust gases from the oxidation tower plus the turpentine components are absorbed and oxidized by a deluge of aqueous chlorine solution.

The gases then pass into a second caustic scrubbing stage before venting to atmosphere. Their odour, now quite innocuous, is similar to hypochlorite bleach solution.

The system is already installed in many countries throughout the world including Canada, the United States, Sweden, Finland, France and Poland. Other installations are being designed and assembled for other countries.

The odour reduction achieved by the British Columbia Research Council system represents an important step forward in the fight to curtail the air pollution problem caused by kraft pulp mills.

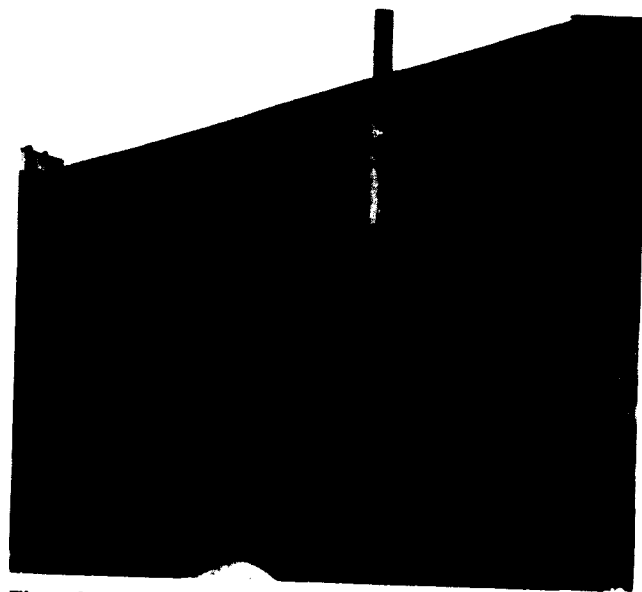
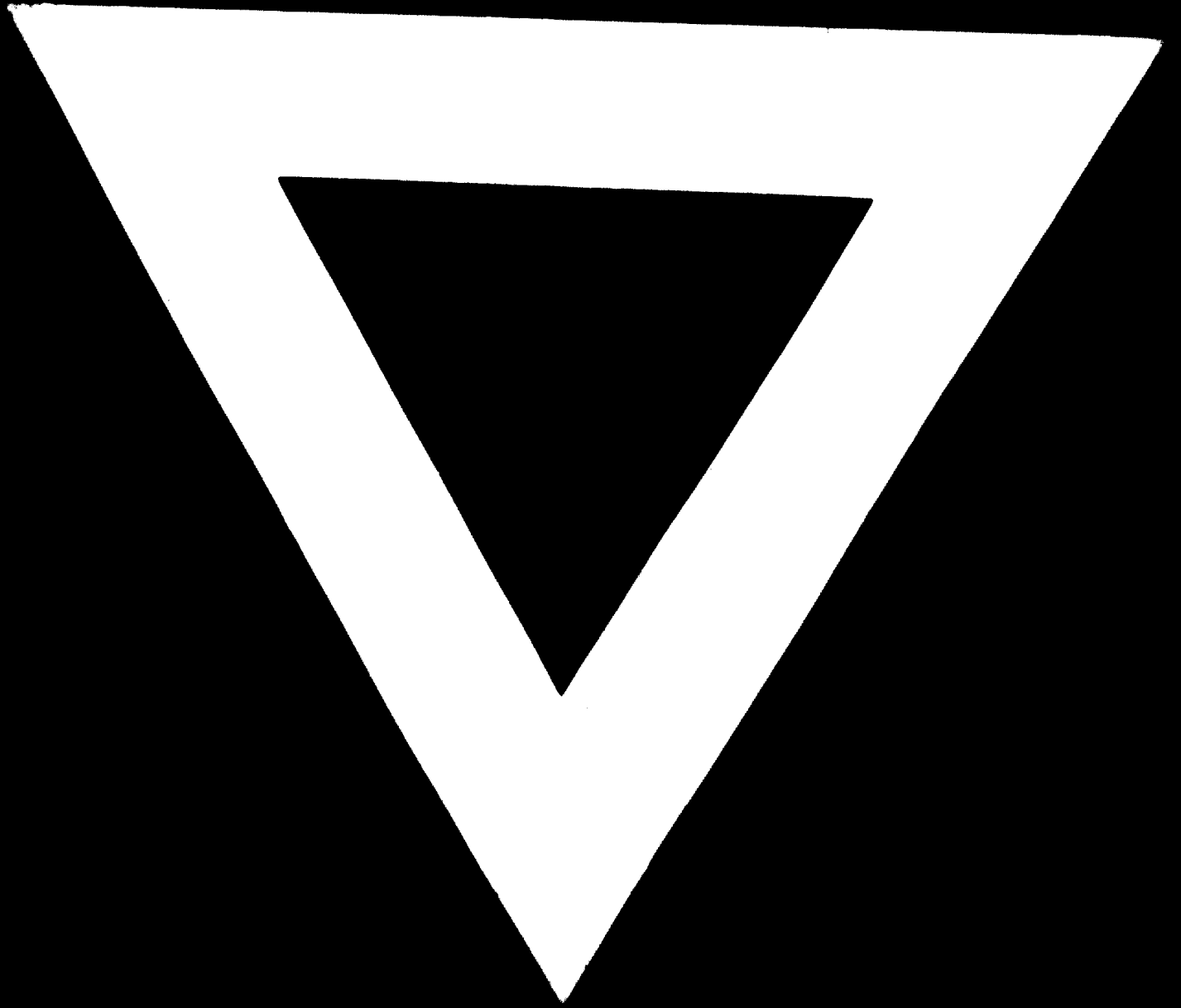


Figure 1. A kraft pulp odour installation developed by BCRC.





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