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AGREEMENT ON SCIENTIFIC, INDUSTRIAL AND TECHNOLOGICAL
CO-OPERATION BETWEEN BELGIUM AND CANADA

Third meeting of the Joint Commission
Ottawa, September 15-18, 1975

SUMMARY AND RESULTS OF THE DISCUSSIONS

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Department of External Affairs

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SUMMARY AND RESULTS OF THE DISCUSSIONS

Department of External Affairs

Composition of the delegations

THE BELGIAN DELEGATION

MEMBERS OF THE JOINT COMMISSION

Mr A Stenmans, Secretary General, Science Policy Planning Service (SPPS).

Miss G Dehoux, Administrative Director, SSPS.

Dr L Groven, Counsellor (Scientific Affairs) to Belgium's embassies in
Ottawa and Washington.

Mr J Bouckaert, Special officer, SPPS.

DELEGATES

MINISTRY OF FOREIGN AFFAIRS

Mr J Bousse, Minister Plenipotentiary, Scientific Branch.

Baron A Guillaume, First Secretary, Embassy of Belgium in Ottawa.

MINISTRY OF AGRICULTURE

Mr J Ronchaine, Agricultural attaché, Belgian embassies in Ottawa and
Washington.

MINISTRY OF ECONOMIC AFFAIRS

Mr A Coessens, Director General, Industry.

Mr J Van Keymeulen, Director, Institute for the Encouragement of
Scientific Research for Industry and Agriculture.

MINISTRY OF PUBLIC HEALTH

Dr A Lafontaine, Director, Hygiene and Epidemiology Laboratory.

SCIENCE POLICY PLANNING SERVICE

Mr J Wautrequin, Researcher; Chief, General and Nuclear Technology Branch.

Mr M Renson, Operational Director, R & D National Environmental Programs
(air and water).

Mr L Hennico, Operational Director, national R & D Data Processing and
Scientific and Technical Information and Documentation
(IDST) programs.

THE CANADIAN DELEGATION

MEMBERS OF THE JOINT COMMISSION

Dr. M. LeClair, Secretary, Ministry of State for Science and Technology

Miss P.A. McDougall, Director-General, Bureau of Economic and Scientific
Affairs, Department of External Affairs

Dr. S. Wagner, General Director, Office of Science and Technology,
Department of Industry, Trade and Commerce

Mr. P. Asselin, Director, European Affairs, Department of Intergovernmental
Affairs, Government of Quebec

DELEGATES

DEPARTMENT OF EXTERNAL AFFAIRS

Mr. G. Rejhon, Deputy Director, Scientific Relations and Environmental
Problems Division

Mr. P. Beaulieu, Counsellor (Scientific), Canadian Embassy, Brussels

Dr. C. Aubé, Scientific Relations and Environmental Problems Division

DEPARTMENT OF INDIAN AND NORTHERN AFFAIRS

Mrs. J. Brown, Chief, External Relations, Liaison and Consultation Group,
Parks Canada

DEPARTMENT OF THE ENVIRONMENT

Mr. S.H. Ujjainwalla, Chief, Canada-Overseas Countries Division, Bilateral
Relations Branch

DEPARTMENT OF NATIONAL HEALTH AND WELFARE

Mr. N. Préfontaine, Assistant Deputy Minister, International and Emergency
Welfare Branch

Dr. D.M. Smith, Senior Scientist, International Health Services

MINISTRY OF STATE FOR SCIENCE AND TECHNOLOGY

Dr. D.I.R. Low, General Director, Government Projects Division

DEPARTMENT OF JUSTICE

Mr. S. Skelly, Senior Counsel, Jurimetrics

DEPARTMENT OF INDUSTRY, TRADE AND COMMERCE

Mr. M.R.M. Dale, Chief, International Division, Office of Science and
Technology

DEPARTMENT OF ENERGY, MINES AND RESOURCES

Dr. P. Charbonnier, Office of Energy Research and Development

Mr. J. Gauthier, Surveys and Mapping Branch

DEPARTMENT OF AGRICULTURE

Dr. J.J. Cartier, Assistant Director-General (Eastern Division),
Research Branch

NATIONAL RESEARCH COUNCIL

Dr. R.S. Rettie, Executive Director, External Relations

Mr. G. Kirouac, Chief, Technical Information Service

GOVERNMENT OF QUEBEC

Mr. G. Paquette, Secretary, International Cooperation, Department of
Intergovernmental Affairs

Mr. L. Beaudoin, Counsellor, Scientific and Technical Cooperation,
Quebec General Delegation, Brussels

Mr. G. Letourneau, General Secretariat, Executive Council

Mr. P. Simoneau, Department of Social Affairs

AGENDA

Monday, September 15

1130 Opening session

1500 Workshops on:

1. Technology and applied research
2. Environment
3. Data processing

1630 Exchanges of views on the results and the functioning of the Agreement

1800 Plenary session of the Joint Commission

Tuesday, September 16

0930 Workshops on:

1. Environment (continued)
2. Health policy
3. Agriculture

1000 Exchanges of information on:

1. Energy
2. Historical conservation
3. Scientific and technological cooperation at the international level
4. Scientific policy - methodology - organization

1400 Workshops on:

1. Social sciences
2. Scientific and technical information and documentation (IDST)

Wednesday, September 17

- 0930 Workshop on:
 1. Social Sciences (continued)
- 0930 Plenary session of the Joint Commission
- 1100 Visit to the National Research Council:
 information on the use of computers in
 education
- 1400 Visit to the Canada Institute for Scientific
 and Technical Information (CISTI)

Thursday, September 18

- 1000 Plenary session of the Joint Commission -
 conclusion of discussions
- 1615 Departure for Toronto

Friday, September 19

- AM Visit to Atomic Energy of Canada Ltd. laboratories
 at Sheridan Park
- PM Visit to the Pickering nuclear power plant

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3. Environment
4. Health policy
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11. Science policy
12. Scientific and technical cooperation in the international sphere

The third meeting of the Joint Commission on Scientific, Industrial and Technological Cooperation between Belgium and Canada was held in Ottawa from September 15 to 18, 1975.

At the opening session Dr. M. LeClair, chairman of the Canadian Delegation, welcomed the members of the Belgian Delegation, noting the special relationship which exists between the two countries.

Mr. A. Stenmans, chairman of the Belgian Delegation, replied and expressed his confidence as to the results which the meeting would produce.

1. GENERAL CONSIDERATIONS

The two sides agreed to give special attention to topics related to the national aims of the two countries, such as improvement of living conditions (including environmental protection), intensification of technological development, especially in small and middle-sized enterprise, improvement of the energy situation and conservation of raw materials.

The two sides consider that the exchange of information undertaken since the Agreement came into effect has made it possible to determine specific channels of cooperation in a number of areas. It is felt that on the basis of these and of any new subjects which may arise between meetings, it should be possible to carry out concrete projects of real interest to both countries.

A flexible approach toward the implementation of the program of cooperation agreed on by the Joint Commission will be needed from those in both countries engaged in working on the topics selected and in carrying

out concrete projects. To this end they will use the means which they judge most useful, with the understanding that the national authorities in charge of the implementation of the Agreement will be kept regularly informed of progress through the active cooperation of accredited science counsellors in both countries.

It is the task of the Joint Commission, under its two chairmen, to coordinate and direct work carried out under the Agreement. In the intervals between Commission meetings the chairmen are also responsible for deciding what action should be taken with respect to new areas for cooperation which may be brought to their attention.

The work which the two countries carry out in cooperation in several international organizations was also discussed. While it was agreed that this form of cooperation would not be made a part of the Commission's set program, the advantages of specialized contacts of this kind were nonetheless acknowledged, in view of the opportunities thus afforded for exchanges on scientific activities.

2. TECHNOLOGY AND APPLIED RESEARCH

The two sides examined the state of progress achieved in cooperation on the areas singled out by the Joint Commission in December 1973.

It was noted that the primary approach chosen at that time, that of promoting contacts and cooperation between industry in the two countries, had not achieved much success, mainly because of problems connected with industrial policy, intellectual property and the secrecy maintained in industry and commerce.

Nevertheless, in view of the fact that results have been registered in some areas, it was agreed that cooperation already undertaken will be pursued along current lines, as in the area of welding, for example.

A report on progress in cooperation in areas decided on at the Commission's previous meeting is included in Appendix II.

The two delegations also agreed to make greater use of the approach consisting in identifying broader areas of research and technology, with particular emphasis on topics relating to each country's national aims, in accordance with the approach approved by the Joint Commission in its general considerations. In this context, it was agreed to explore further the possibilities for cooperation between university-allied research organizations and/or centres for technology.

The Belgian representatives suggested some projects of research organizations (see Appendix I). These projects were examined and possible participants indicated by the Canadian Delegation (see Appendix II). Canada undertook to see that these projects were submitted for consideration by industrial, provincial and university research organizations likely to be interested.

Belgium will be informed which topics are found suitable for possible cooperative proposals. The Belgian Delegation, for its part, took note of the Canadian proposal regarding catalase (see Appendix III) and will make its response known following consultation with the Belgian authorities and organizations concerned.

Finally, the Canadian Delegation will explore possibilities for cooperation on two topics suggested by Belgium:

- development of "technological guidance" formulas for the benefit of small and medium-sized industries with no research infrastructure of their own;
- development of formulas for the promotion of exploratory studies to enable these industries to act promptly on developing their own new findings or those of university laboratories.

3. THE ENVIRONMENT

The two sides took stock of the contacts and cooperation brought about since the beginning of the Agreement and took note of the activities of international organizations in which both countries participate. They noted that, with the conclusion of the first phase of concrete initiatives, they are now embarking on the Agreement's second phase. Results obtained in this area since the last meeting of the Joint Commission are listed in Appendix IV. A second phase of information exchange was launched, with the following as selected topics:

a. Air pollution

It was agreed that there would be exchanges of information by the two sides and if necessary communication between experts by means of mutual visits, on the specific subject:

evaluation of continuous-measuring systems and equipment -
as well as manual methods - for monitoring chimney emissions.

In addition, it was agreed that the topic "transfer of air pollutants into other media" would be the subject of complementary studies by the two sides.

b. Water Management

Both sides remain interested in the establishment of a total management model, but further study is required in this matter. For the time being all available information will be exchanged on areas including:

- analytical methods;
- data banks;
- data collection and storage.

Belgium is shortly to submit its final report on the Sambre River Study.

Salt water studies

The two sides are agreed that, during the exploratory stage, the compatibility of data collection buoys will be examined.

- Oceanography remains an area open to the sharing of information.

c. Petroleum products: surface spills

The two sides have agreed to exchange information on the following:

- operational evaluation of recovery and diking equipment;
- dispersants;
- counter-measures in fast-flowing waters;
- use of models to predict the movement and impact of dispersed oil.

A visit by a Canadian expert may be arranged with a view to deciding on possible action to be taken.

* * *

The Belgian Delegation studied the project proposed by Parks Canada, Department of Indian and Northern Affairs, concerning the characteristics of estuaries and marshes.

It will pass on this proposal to the Belgian authorities concerned and will communicate the reaction obtained. A preliminary exchange of information will be undertaken in the meantime.

4. HEALTH POLICY

The two sides exchanged views and reference material on problems related to medical data processing, computerized emergency care, various forms of preventive medicine, and the use of the WHO model for health care utilization.

It was decided that a Belgian Delegation would be sent to Canada to study the methodology of the national inquiry into health care, with a view to the possible launching of a similar inquiry as part of the Belgian national research program in the social sciences.

In addition Dr. S. Halter, Secretary General of the Belgian Ministry of Public Health, will soon visit Canada to gather information on a number of technical and organizational matters related to health care and services, especially the problems involved in regionalization of services and solutions being considered at the federal and provincial levels, as well as environment-related health problems and problems of cooperation with international organizations such as WHO.

Representatives of the Quebec Department of Social Affairs, on a visit to Belgium in January 1975, found evidence of Belgian interest in cooperation in certain areas of public health. As a follow-up to this visit the Quebec Delegation to the meeting tabled the proposals for cooperation to be found in Appendix V.

The Belgian Delegation took note of these proposals and will submit them for consideration by the relevant Belgian authorities; it will report on the conclusions reached.

5. SOCIAL SCIENCES

The two sides exchanged information on research in social policy and management carried out by the relevant departments in each country. The Belgian Delegation provided the Canadians with a complete description of the national program, its objectives and structure, as well as the coordinating and follow-up procedures used in its implementation. At the request of the Canadians, Belgium also provided background material on the organization of Belgian social assistance, family planning and home assistance services.

Canada provided a description of the organization and structure of research in the Department of National Health and Welfare, as well as a look at the federal-provincial review process for the Canadian social security system. It also showed the BENTAX and STACKER models which it uses for simulating the impact of various income support and supplement programs on individuals and groups, and explained the system which gives both levels of government access to a bank of social data known as the "Social Security Research Library - Bibliothèque de recherche en sécurité sociale" (SSRL/BRSS). Researchers and administrators of the various governments can use this data bank to process the same base data using different variables. Canada provided a substantial amount of reference material on this subject.

The two sides exchanged information with respect to transferring the results of research directed by decisions made at the political and

administrative levels. In this connection the Quebec representatives, at Belgium's request, provided information on the implementation of the reports of the Castonguay/Nepveu Commission.

The two sides identified a number of differences in structure and approach in public-oriented social research, as a means of determining areas in which systematic exchanges of information would prove useful. Information will be exchanged on the subjects mentioned above and on the measures which each country applies in its present social assistance and development programs; on the basis of this input a decision will be made as to whether joint cooperation projects should be undertaken.

In this context:

- a) Canada will be kept informed of progress in the Belgian national program and will receive interim reports from the scientific and technical coordination groups, which will make it possible to determine specific points of mutual interest.
- b) Belgium will receive information on the Canadian experiment in setting up the SSRL/BRSS social data bank and the BENTAX and STACKER simulation models for decision-making in the social security area. Canada is open to an early visit by a Belgian Delegation engaged in similar work in the Belgian national program.

The two sides agreed to postpone consideration of whether a conference on social indicators should be held.

6. AGRICULTURE

The Belgian Delegation did not include any representatives

of the Agricultural Research Branch of the Ministry of Agriculture, but the Branch was told of the exchange of information to be conducted at this session at Canada's request and the Director General of Agricultural Research in Belgium provided Canada's scientific counsellor in Brussels with reference material for distribution to the Canadian Delegation.

Each delegation gave a presentation on the organization of agricultural research in its country - structure, personnel and operation. A look at reports and activity programs then made it possible to identify subjects of possible mutual interest.

Agreement was reached on the phases which cooperation could take, as follows:

- exchanges of information
- exchanges of specialists
- sharing of work in joint projects.

Canada's Department of Agriculture will send a study mission to Belgium in early 1976 once agreement has been reached on the program for the visit. It was agreed that preliminary contacts would take place at the research administration level.

An important consideration for both sides in the planned cooperation will be the economic effects of certain kinds of research such as that dealing with the transmission of plant and animal diseases.

7. SCIENTIFIC AND TECHNICAL INFORMATION AND DOCUMENTATION

The pilot project being conducted at Belgium's Centre de Diffusion de l'information technologique et commerciale (CEDITEC) using Canadian Techbriefs provided by the NRC (CISTI) is proceeding well and will come up for assessment in 1975. If, as everything would seem to indicate, the experiment is a viable one, and it is decided to expand it

to include a greater number of businesses, CISTI and CEDITEC will have to make financial and/or cooperative arrangements for the collection and processing of input.

It is expected that this project will lead to productive collaboration, since CEDITEC will without doubt be able to provide French texts on certain specialized subjects for use in the Canadian system. Other organizations in Belgium interested in this type of collaboration could be considered for involvement.

Belgium will study the advisability of sending specialists to the NRC's Technical Information Service to study the Canadian system.

There was also an exchange of views regarding the work done by the Canadian Technical Information Service to help small and medium-sized businesses, covering services provided, evaluation of benefits and profiles of consulting engineers made available to Belgium's PME (established program), etc.

8. DATA PROCESSING

a) Automatic cartography

Belgium gave a brief description of the Geographical Institute's work in this area and tabled a document.

Canada gave a presentation on the development of automatic cartography in Canada, its objectives and achievements and the size of the budgets involved.

It was agreed that Canada would send reference material and/or a memorandum on this subject to Belgium as part of an exchange of correspondence to prepare for a visit to Canada by the appropriate project manager in the Belgian national program of research on data processing. The purpose of this visit would be: (a) to acquire

information on certain specific points arising from the correspondence and (b) to study the advisability of exchanging researchers and sending an expert to Belgium.

b) Interuniversity computer network

Canada provided Belgium with information on the reasons - economic, technical and related to interuniversity politics - which led to the abandonment of the CANUNET project in its initial form. Belgium will thus be able to draw on the Canadian experience for help in identifying similar problems which might arise in Belgium.

Canada will also put the Belgian Delegation into contact with a Canadian organization able to help the appropriate project manager in the Belgian national research program on data processing with technical questions relating to the establishment of computer networks.

c) Data processing as used in law

A study of the various problems related to the processing of legal data showed that no new projects are feasible under current conditions. The two sides felt that in the current state of affairs it would be advisable for them to concentrate on an internal phase of the work consisting in studying means of solving printing problems in an economical way. They could take advantage of this phase to accumulate proven and coded data for other uses, that is, for research operations.

Thus, no concrete cooperation is planned for the time being, but the two departments of justice will remain in contact.

9. ENERGY

A. The two sides exchanged information on new efforts in energy research and development in both countries and on the budgets allocated to this area of research. Belgium, which earlier had provided Canadian

authorities with a document describing its national R and D program, reviewed the program's content and procedures.

Canada reported on the projects studied by the Interdepartmental Committee on Energy Research and Development.

B. The two sides agreed:

- to keep each other informed on the progress of their respective national programs;
- to maintain their bilateral exchange of information, especially as regards initiatives undertaken in the area of energy research and development, in the international organizations to which both countries belong;
- to keep the door open on possibilities for cooperation on the principal points of interest listed by Belgium in its Note submitted to the Canadian Delegation (Appendix VI).

With a view to better defining possibilities of cooperation for the future, Canada gave Belgium a list of points of contact related to the areas suggested by Belgium. Canada has already shown special interest in the area of coal distillation.

10. HISTORICAL CONSERVATION

Belgium noted that its delegation did not include any representatives of the Ministries of Culture, who have jurisdiction over most of the matters dealt with in the document tabled by the Canadian Delegation (see Appendix VII). The Ministries of Culture received copies of this document as soon as it was filed and the chairman of the Belgian Delegation will report to them on the subject of Canada's proposals for cooperation and exchanges of information.

Canada provided some reference material and promised more on certain points (information on the Canadian program for the training of specialized architects).

Belgium will identify public and eventually private organizations which could be considered as valid contact points in the various areas of interest to the Canadian side. Belgium will also try to quickly gather information on Belgian legislation in the field of protected areas and will transmit it to the Canadian side.

The two sides agreed that the creation of a special committee for exchanges in the field of historic conservation was premature.

11. SCIENCE POLICY

Exchanges of information in the field of science policy methodology will be continued: the meeting has allowed Canadian experts to gather information on the methodology of financing and managing Belgian R&D national programs. It was noted that the first Belgian R&D national program (environment-water) is reaching completion and it would be interesting to exchange information on the methods of results transfer, mainly at the decision-making level. This will allow Canada to increase its knowledge of the Belgian mechanisms in this field.

The joint study by MOSST and SPPS through UNESCO is continuing. Belgium will provide, within the agreed deadline, a copy of the report which it is preparing for the meeting organized by UNESCO. MOSST and SPPS delegates will discuss the report at the time of the meeting.

Quebec's interest in the evaluation and upgrading of university research was noted and the Quebec representatives tabled a proposal for

cooperation, the text of which can be found in Appendix VIII. Belgium will submit the proposal to the relevant authorities and let Quebec know what action is planned on this matter.

12. SCIENTIFIC AND TECHNICAL COOPERATION IN THE INTERNATIONAL SPHERE

The two sides noted that cooperation between Belgium and Canada in international organizations concerned with science and technology is furthered by the exchanges of information provided for under the Agreement. The exchanges of information by the two delegations to the OECD's CSTP and NATO's CCMS were particularly noted.

Canada confirmed its interest in increased cooperation with European countries in the area of space research. This session was used as an occasion for an exchange of views on this subject.

Program

The Committee brings together producers and users of materials, an information centre on a metal, and a metallurgical research centre. Its goal is to create and develop materials, particularly metallic materials.

For several years the Committee, and especially the non-ferrous metals section of the CRM, has undertaken a considerable amount of cobalt-related research. In particular it has studied magnetic alloys containing cobalt, super-alloys of cobalt and nickel, and high-tensile steels to which this metal has been added.

The CRM has thus been able to gather a considerable body of knowledge on potential applications of this metal in various fields, not only at the scientific but also at the technological level. For example, forming techniques using powder metallurgy, directed solidification, and so on, have been widely studied.

The research group has created new families of alloys, some of which are in regular use in industry. Among others may be cited:

- the UNCo-50-51-52 alloys, which have proved to be remarkably effective in some thermal processing oven applications;
- the S57, S583 superalloy group, which has shown itself to be the best heat-corrosion resistant alloy in environments of combustion gases polluted with sulphur, vanadium, alkaline metals, and so on. The S57 alloy in particular has been under study in Europe and the United States for possible application in the form of protective coatings for gas turbine parts;

- a titanium alloy (Ti-6Al-4V-3Co) for which an application has been found in high strength aircraft bolts.

This research activity has been taking various directions, and has resulted in important developments at the industrial level: ductile cobalt (Co-3Ti) for composite recharging electrodes, abrasion and corrosion resistant Stellite-type alloys and heat resistant steels containing cobalt.

CENTEXBEL

CENTRE SCIENTIFIQUE ET TECHNIQUE DE L'INDUSTRIE

TEXTILE BELGE

(BELGIAN TEXTILE INDUSTRY SCIENTIFIC AND TECHNICAL CENTRE)

Organization

1. Structure, purpose, representation

Centexbel was created in 1950 as a non-profit association, on the initiative of a group of Belgian industrialists under the auspices of the Fédération de l'Industrie Textile Belge, "FEBELTEX" (Belgian Textile Industry Federation).

Manufacturers belong to Centexbel by voluntary subscription of annual dues. Members have access to the common services provided by the Centre.

The purpose of the Centre is threefold: to promote, to carry out, and to coordinate scientific research for the benefit of the Belgian textile industry, so as to improve efficiency, quality and production.

At present the Centre has 350 member companies, out of a possible total of some 1500. These 350 firms represent about 40% of the labour force employed in the Belgian textile industry.

2. Activities

The activities of Centexbel are twofold:

- to contribute to the growth of knowledge through research in the textile field which will benefit this sector of the economy;

- to disseminate this knowledge throughout the textile industry.

Centexbel has never until now undertaken any activity concerned with controls, analysis, testing, or evaluation; it has left the initiative in these areas to specialized laboratories, with which it has the best of relations.

2.1. Applied and experimental basic research, and technical studies

This is the most important activity. At present it employs 17 researchers - scientific and engineering staff; and 17 technicians and other workers.

Brief comments on the research topics are given in the Centexbel annual report.

2.2. Documentary research

An engineer and a research assistant are involved in indexing bibliographic articles. Centexbel receives about 90 periodicals, among them the major scientific and technical textile journals published around the world. Centexbel has been involved since 1970 in international cooperation in this area with West Germany, Spain, France, Great Britain and Italy.

2.3. Secondary activities: dissemination of knowledge

Results of research are disseminated in three forms:

- Information and technical assistance service

This department, the role of which is to maintain direct contacts with industry, is made up of one engineer and one

technician, who work with the researchers and the documentation department.

- Publication

Aside from the annual report on activities, Centexbel publishes a highly scientific review entitled "Annales Scientifiques Textiles Belges" which appears quarterly.

- Textile standardization

Centexbel, on behalf of Fébeltex, is also involved in textile standardization, under the Institut Belge de Normalisation (Belgian Standards Institute). No individual is specifically assigned to this department.

Responsibility for these activities rests with the Director of Centexbel, assisted by a secretarial and accounting staff of four persons.

To carry out the various above-mentioned activities, Centexbel has a total staff of 43.

3. Structure

3.1. Administration

Centexbel is administered by a board of directors made up of prominent individuals from different sectors of the textile industry.

A management committee made up of the president, the three vice-presidents and the director of Centexbel, acting on authority from the board, manages the Centre. Day-to-day administration of the

Centre is carried out by the Director. Management, and the documentation and administration departments have their offices in a section of the Maison de l'Industrie Textile (Textile Industry House) in Brussels.

3.2. Scientific and technical activities

Centexbel does not own its research facilities; staff is located in different institutions and firms, constituting research cells in one or more specific fields. Thus the Centre's research staff is divided between four locations according to the object of the research:

- Laboratorium DE MEULEMEESTER voor Technologie der Kunststoffen, State University of Ghent: cotton, linen, and jute;
- Laboratoire CENTEXBEL de Tournai (Ecole Supérieure des Textiles et de Bonneterie), Tournai: knitting industry;
- Laboratoire ANDRE PELTZER de Centexbel, S.A. Peltzer & Fils, Verviers: wool;
- Laboratoire de FABELTA, Tubize: chemical fibres.

The scientific staff of Centexbel is divided between the four laboratories and works under the direction of the laboratory director or officers in charge of research. The laboratory directors are not part of the Centre's staff; the officers in charge of research, however, are. A scientific commission acts as scientific adviser to the board of directors, and coordinates research.

4. Proposed areas of cooperation with Canada

4.1. Cotton spinning

Since it was formed, Centexbel has developed a research program in this sub-sector. The following major topics are studied:

- the causes of formation of neps, and precautions to be taken to avoid them
- card acceleration
- cleaning and mixing of cottons
- spinning limit in relation to the number of breaks on spinning frames
- open-end spinning

The present program covers three points:

- determination by computer of optimum mixtures for cotton
- research into electroclimatological factors which may disrupt the spinning operation;
- the perfecting of testing methods for the blending of artificial and synthetic fibres with cotton material.

4.2. Linon

After studying and perfecting methods for determining the characteristics of long strand fibres and flax tow, Centexbel proceeded to examine methods of preparation, spinning and bleaching of linen, to find those methods most compatible with subsequent finishing treatments of pure linen fabrics and linen/synthetic blends; the aim is to give these fabrics permanent press, soil release, and even non-flammability characteristics, without significantly affecting or changing the appearance of the fabric.

4.3. Hosiery yarns and knitting

Centexbel has been taking part since 1970 in a European experimental exchange group, engaged in a research program to develop methods of measuring creping contraction in texturized yarns, an important characteristic in this type of yarn and one which is particularly difficult to measure.

At the same time as the above, Centexbel is attempting to research the relationships between the characteristics of texturized yarns and knits.

4.4. Enquiry into productivity in the cotton manufacturing sector

International surveys and comparison studies regarding productivity have been organized in Europe since 1962; these enquiries are based on precise, detailed methods jointly developed by Germany, Belgium and France.

L'Association belge des filateurs de coton et de fibres connexes (spinning of cotton and related fibres) and the Comité belge du tissage (weaving) have requested Centexbel to see that Belgium is represented at and participates in these surveys.

In 1974, 350 spinning-mills in Germany, Austria, Belgium, France, Finland, Great Britain, Italy, the Netherlands and Switzerland compared their productivity with respect to labour and materials. The same countries, except for the Netherlands and Great Britain, made a comparison study of productivity for 160 different cloth weaving mills.

Each participating country is entitled to sponsor a new country for membership. If the membership is accepted, the country should be able to participate with a number of firms representing at least 50% of its production in that sub-sector.

S A GLAVERBEL-MECANIVER

Le Centre de Recherches de Glaverbel-Mécaniver (Glaverbel-Mécaniver Research Centre) employs about 250 people, 70 of them highly qualified researchers.

The basic and applied research departments are located in modern, recently-built buildings with an area of about 10,000 m². Development and pilot project departments are located in fully-equipped testing laboratories covering about 20,000 m².

The equipment is very complete: aside from the very specialized research and testing installations, it includes a mineralogy laboratory and a sizable quantity of heavy equipment, for example an electron scanning microscope, Auger-Esca, and so on.

The major fields of specialization are:

- the manufacture, melting, and forming of glass
- heat production and utilization
- thin layers
- physico-chemistry
- solid state chemistry
- properties of materials
- special metals and polymers
- fluid mechanics
- automation
- refraction and so on.

The Research Centre also operates programs for industrial purposes; these are closely related to marketing studies.

Suggested areas of cooperation

- adaptation and use of natural materials: aluminous rocks rich in sodium
effect on the kinetics of fusion
- research into raw materials for coloured glass
- refractive materials (the CRJ* has a large centre, the CEMR**) and especially high performance materials
- the thin layers having unusual optical and electrical properties
- heavy duty glass for high-contrast climates
- mechanical properties, reinforcement
- plastic materials that can be used with glass.

* CRJ: Centre de Recherches de Jumet

** CEMR: Centre d'Etude des Matériaux Réfractaires
(Refractive materials)

CENTRE DE RECHERCHES SCIENTIFIQUES ET TECHNIQUES DE
L'INDUSTRIE DES FABRICATIONS METALLIQUES

CRIF

(SCIENTIFIC AND TECHNICAL RESEARCH CENTRE FOR THE
METAL MANUFACTURING INDUSTRY)

Purpose of research

To do research on industrial waste recovery in plastic materials transformation industries, and to extend this study to the recycling of such wastes originating in the city and the household.

Organization of research

CRIF

Directors: R STINGLHAMBER, ir., Director of the Centre

G VIATOUR, ir., Head of Research

Co-researchers: G MICHEELS, ir.

H FREDERIX, ir.

D PODGORSKI, ing.

J C LAMBERT, ing.

Macromolecular chemistry and organic catalysis laboratory,

Université de Liège:

Director: Prof P TEYSSIE

Program

Preliminary research has shown that polymeric alloys are a scientific and technical reality. Technical parts have even been manufactured from these polymer alloys.

On the basis of these very encouraging results, it has been decided to pursue this line of research further, according to the following plan:

- a number of polymer alloys are manufactured using standard mixtures, consisting mainly of polyethylene, polyvinyl chloride, and polystyrene, and possibly by polydiene, polyester, and polyamide.
- these different alloys are formed by various techniques which are or will be available to CRIF, that is, the processing machinery acquired at the end of 1973-74, and machines reused in this research project.
- each machine allows a study to be made of the effect of the operating parameters on the properties of the material itself.
- in a parallel study, polymer alloys are analysed and characterized as follows:
 - mechanical characteristics
 - rheological (flow and deformation) characteristics in forming
 - alloy structure characteristics

This part of the study is being carried out by Professor Teyssie's laboratories.

The plan of the study is as follows:

- to demonstrate the modifications which polymeric materials undergo in the course of processing, by determining molecular masses and their distribution, and by chemical and spectral analysis;
- to observe phases in polymeric alloys and develop methods of marking certain polymers. Thus, by optical microscopy (and, if

necessary, electron microscopy) it is possible to observe the dispersion in each phase, the average size, and the granulometry of the particles.

- to study the regulation and control of the phases through the addition of particular mineral charges or of sequential or grafted copolymers, which of course will have to be synthesized. This part of the study, however, cannot be contemplated until the first two parts have been mastered; furthermore, since this aspect of polymeric mixtures is little known, it may require a relatively long period of study and thought which would extend beyond two years.

On the basis of measured physical, mechanical, and rheological characteristics, we are attempting to establish and compare different theoretical models, so as to lay down the groundwork for a theory governing the behaviour of polymeric alloys. This work can be carried on simultaneously with some of the studies detailed above, but it is in any case a long-term project.

The ultimate goal of the research should be to allow us to study and master the behaviour of polymeric mixtures or alloys, both during manufacture and utilization and in the finished product, the ideal of course being to recover industrial and urban wastes.

The result of this research in future years should be the creation of a plant to recycle all plastic waste materials.

SYNDICAT D'ETUDES INTERINDUSTRIES - CONSTRUCTION

IC - IB

(INTERINDUSTRY STUDY UNION - CONSTRUCTION)

Purpose of research

To advance the process of industrialization in the building industry through collective research and development aid, by defining the requirements made of the builder and the performance required of industrial components and complexes. This procedure will be applied to particular products of direct concern to various industrial sectors.

Organization of research

Directors: HERBIET, ir., Vice-president of IC-IB
 DUTRON, ir., Director, CRIC
 D'HAVE, ir., Director General, SECO office
 BAAR, ir., dr.sc., Director, SERCOM
 MOTTEU, ir., Chief Engineer, CSTC
 HENRY, lic.sc., Administrator, IC-IB
 CAILLIEZ, ir., Scientific Director, IVP
 GILARD, ir., Director, INV

CRIC : Centre de Recherches de l'Industrie Cimentière (cement industry)
SECO : Bureau de Contrôle pour la Sécurité de la Construction en Belgique (construction safety office)
SERCOM : Station d'essais et de recherches de la construction métallique (metal construction testing and research)
IVP : Industrie des Vernis, Peintures, Mastics, Encres d'imprimerie et Couleurs d'art (varnishes, paints, sealing compounds, printing, ink, and artist's paints)
INV : Institute National du Verre (glass institute)

SONNEMANS, ir., Director IBB

Co-researchers:

DE REGGE, ir., SECO

DUGNIOLLE, ir., CSTC

GERARD, ir., CSTC

GERON, ir., IC-IB

GUILLAUME, ir., CSTC

HENRION, ing., CBR

HICK, ir., SERCOM

PAGNOULE, lic.sc., INV

PFEFFERMAN, ir., CSTC

PILLAERT, ir., CSTC

PTACEK, ir., CSTC

RICHELLE, ir., permanent secretary, IC-IB

SEVRIN, ir., IC-IB

UYTENEROECK, ir., CSTC

VAN LIERDE, ing. CTIB

VERVAET, ir., CSTC

WAUTERS, ir., KUL

-
- IBB : Institute Belge du Bois
(wood institute)
- CBR : Cimenteries et Briqueteries Réunies
(cement and brickmakers)
- KUL : Katholieke Univeriteit Leuven
(Catholic University of Louvain)
- CTIB : Centre Technique de l'Industrie Belge du Bois
(wood industry)
- CSTC : Centre Scientifique et Technique de la construction
(construction scientific and technical centre)

Research is carried out in various associated industrial centres and laboratories, and in several university laboratories.

Research program

1. Industrialized structures

The first part of this study concerns the problems of supports and jointing. Researchers are testing supports for prefabricated components under the most unfavourable conditions revealed by the study on dimension tolerances, as well as studying the jointing of beams to columns, paying particular attention to the problems created by connections without visible brackets. Simultaneously the study of problems of support continuity between prefabricated slabs has been broadened to cover special diameter and anchor rod overlap cases met in practice. Attention is then given to the operation of the apparatus for testing vertical joints between wall components.

Finally, the program includes collecting additional data on load distribution between juxtaposed floor components, for dead loads and dynamic loads as well as for long-duration loading, and on the influence of a previous dynamic load on distribution under dead load, with the aim of determining distribution coefficients.

The second part has to do with the chain destruction of prefabricated buildings. Among others this includes a theoretical study of load transmission paths in the case of an accidental failure of a load-bearing component of a prefabricated building, with the aim

of avoiding chain destruction.

These first two parts concern basic problems relating to the safety of support and jointing devices used in many types of pre-fabricated concrete construction.

The third part touches on future prospects for the development of prefabrication using concrete components.

The researchers are studying in particular open systems of heavy prefabrication. Through this theoretical study they are attempting to develop an open prefabrication system using components available from different producers, which the project designer can link together without problems with respect to tolerances or quality.

2. Durability of decorative concrete

The program includes the laboratory study of the effect of freezing on the durability of structural concrete, through a more intensive examination of compositions selected from the results of past research. At the same time, on-site observations are made of the behaviour of about forty different buildings. These are constructed with concrete components whose composition has been previously studied, with some variations. The purpose is to establish a parallel between laboratory test results on frost cracking and the actual behaviour of structural components on the site. These results are given close scrutiny, with a view to detecting possible frost damage such as cracking or splintering. In addition, the condition of repairs made will be examined where appropriate.

Of all climatic factors, only frost can have a possible influence on the intrinsic durability of concrete. The study of frost implies determining the physical characteristics of the material in relation to water, as well as its mechanical characteristics. The ultimate goal is to establish correlations between these various characteristics and the sensitivity to freezing of structural concrete. These correlations should permit general rules of good practice to be established.

The observation and measurement of humidity in situ are intended to demonstrate the behaviour of decorative concrete in relation to normal atmospheric factors, such as rain or freezing. In addition, this observation is useful in examining the durability of appearance, which essentially involves resistance to soiling; this observation, combined with knowledge of the composition of concrete, its surface treatment and its physical properties of water absorption, such as porosity and capillarity, has as its purpose to gather general information which should lead to the establishment of recommendations for the prevention of structural defects and the improvement of durability of appearance of decorative concrete.

3. Reinforced masonry

Research in this area involves studying the physical and mechanical properties of reinforced masonry, in order to suggest methods of calculating and developing prefabricated panels.

Reinforcement of masonry gives the material greater mechanical strength, which, in a number of cases, allows for the construction of homogeneous components without a concrete or metal framework and eliminates concrete supporting walls or pillars, lintel beams, bracing walls, and so on, resulting in a sometimes considerable reduction in cost.

This technique allows small and medium sized businesses to increase their productivity while using traditional manpower (masons) and less construction site equipment. By improving mechanical characteristics and achieving a more uniform distribution of stresses and homogeneity of construction, reinforced masonry makes it possible to avoid problems resulting from the differential movement frequently encountered in concrete frame construction with filler walls; in addition, the homogeneity of the unit reduces the risk of thermal bridges or condensation.

4. Load-bearing sandwich panels

This study focuses on the physical and mechanical characteristics of sandwich panels, in order to suggest a method of calculation and to develop their use as bearing components.

In addition to previous research, particular attention is given to the study of creep and of aging, in order to effect a check on the durability of performance. Moreover, additional mechanical tests are being carried out on panels produced as a result of the first series of tests, as well as fatigue tests on the foams which form

the core of the panel. Attention is given as well to the study of secured panel assemblies.

We may note also that in parallel to these studies, a study of the effect of fire on these sandwich panels is being done by the national commission on fire research, and that two bibliographic studies are being compiled, one on acoustic insulation and the second on thermal performance of sandwich panels.

From an economic point of view, the load-bearing sandwich panel market is strong in other countries, particularly in the United States. Many small buildings - schools, churches, houses - have walls, roof and flooring constructed entirely of this type of panel. The aim of this study is to be able to satisfy a similar market in Belgium, and thus to develop an industry which until now has been practically non-existent in our country.

5. Influence of joints on acoustic comfort

This is a study of the joints between movable partitions and floors and vertical walls, and of the effect of uneven wall or floor surfaces on acoustic insulation of the partition, together with an analysis of sealing devices. This part of the research seeks, by proper design of joints between partitions and an irregular structure, to prevent downgrading of a partition which in itself is up to standard.

The researchers are also studying sound-insulating horizontal baffles (?), and the influence of ceilings with recessed light fixtures on sound insulation between adjoining areas separated by movable partitions. This research seeks, through better knowledge of the materials used in ceiling baffles, to prescribe a design better adapted to the desired level of sound insulation.

In practice, these improvements should permit a reduction in manufacturing costs, with no loss of comfort, thanks to better use of the materials involved.

6. Air-flow systems -----

This study concerns the behaviour of air circulation and extraction systems in housing, and aims to rationalize design, dimensions and construction. For reasons of hygiene, comfort and economy (heat recovery), provision should be made for considerable development of mechanical air circulation systems in housing over the years ahead. It is therefore essential to improve our knowledge of the quality of circulation in ventilation systems in living quarters, and its influence on comfort.

The arrangement of registers and return vents, the presence of cold walls or heat-producing bodies, as well as the flow and temperature of the air discharged into the room, are all parameters to be taken into consideration. The method used in the laboratory to estimate the quality of air circulation should lead to practical applications for control in situ.

The research should lead as well to the development of a computer program for determining "airauleic" networks, resulting in an opportunity to "pre-balance" the systems at the factory, which would represent a considerable saving of work on the site.

Lastly, a technical and economic study prior to any tests of heat recovery using exchanges should permit the selection of possible solutions taking into consideration the climate in Belgium and our type of housing.

7. Visual comfort

This research is aimed at developing methods of designing, and optimizing the characteristics of, outside glassed-in bays, taking into account criteria for lighting and overall economic cost (investment and operation). It should thus lead to the definition of a value which will make it possible to judge the economic efficiency of natural lighting methods in living quarters.

Attention is first focussed on a synthesis of the criteria for lighting, then on the determination of the characteristic influence of a bay on the natural lighting in an area, taking into consideration criteria for visual comfort, and finally on the determination of the amount of additional artificial lighting needed in areas where natural lighting alone is insufficient for visual comfort.

8. Painting prefabricated components

This study deals with the formulation of bonding primers for "difficult" surfaces, applied in the workshop to components to be given a functional finish after installation, and as well with the formulation of finishing coats which are adapted to these primers, offer specific functional or esthetic characteristics, and are applied after assembly.

The study of the protection and decoration of plastic components which can be used in industrialized construction is in the very early stages, particularly with respect to units such as window frames, panels, ducts, roofing, and so on. In 1969, 6% of plastic products received a paint-on coating. Although the results so far obtained are not always available, there is no doubt that prediction of the durability of a plastic component used in industrialized construction will soon require the use of a film-producing protective maintenance or even primary coat. It will then be imperative to intensify study of the formulation and application of paints for new or aging plastic surfaces.

The program includes surface treatment, the application of adhesive or bonding coats and the application of finishing systems to maintain this adhesive quality while at the same time giving suitable protection and esthetic qualities. The results achieved by these studies should lead to the setting of practical performance levels with respect to durability.

COMMISSION NATIONALE "RECHERCHE INCENDIE"

(NATIONAL FIRE RESEARCH COMMISSION)

Purpose of research

To promote fire protection in buildings, through research aimed at achieving maximum safety and optimizing the cost of technical protection measures, through the revision of existing standards and regulations in the light of new knowledge concerning the fire resistance of concrete and steel structures (including research on component materials), reaction to fire and toxicity of materials, and problems of air conditioning installations with respect to fire.

Organization of research

1. General co-ordination

Directors: Prof G A HERPOL, ir. (RUG)
 H MOTTEU, ir. chief engineer (CSTC)
Co-researchers: J ABSIL, lic.sc., researcher (CSTC)

2. Research on structures

Directors: H MOTTEU, ir., chief engineer (CSTC)
 M MINNE, ir., lecturer (RUG)

RUG : Rijksuniversiteit van Gent (State University of Ghent)
CSTC : Centre Scientifique et Technique de la Construction
 (Construction)
CRIF : Centre de Recherches Scientifiques et Techniques de
 l'Industrie des Fabrications Métalliques (metal products)
SERCOM : Station d'essais et de recherches de la construction
 métallique (metal testing and research centre)

L DEMOL, ir., department head (CRIF)
M BAAR, ir., director (SERCOM)
Co-researchers: J ABSIL, lic.sc., researcher (CSTC)
M BRENNEISEN, ir., research head (ULg)
M HICK, ir. (SERCOM)
M VAN ACKER, ir. (CBR)
M DOTREPPE, ir., assistant (ULg)

3. Research on a prefabricated concrete building

Director: P DUTRON, ir. (CRIC)
Co-researchers: Y COLLET, ir., researcher (CRIC)
M MINNE, ir., lecturer (RUG)
M ALMEY, ir., assistant (RUG)
M VAN ACKER, ir. (UACB)

4. Research on reaction to fire and toxicity of materials

Director: P L GERARD, ir., Secretary General (Féchimie)
Co-researchers: M MINNE, ir., lecturer (RUG)
Miss HERPOL, dr.sc. (RUG)

5. Research on smoke evacuation

Director: J UYTTEBROECK, ir. division head (CSTC)

ULg : University of Liège
CBR : Cimenteries et Briqueteries Réunies (cement and brickmaking)
CRIC : Centre de Recherches de l'Industrie Cimentière
(cement research)
UACB : Union des Agglomérés de Ciment de Belgique
(cement conglomerates)
Féchimie: Fédération des Industries Chimiques (chemical industry)

Co-researchers: J ABSIL, lic.sc., researcher (CSTC)
M CARONARO, ir. (IVK)
M GUILLAUME, ir., researcher (CSTC)
J PTACEK, ir., principal researcher(CSTC)

The research is carried out at the Faculties of Applied Sciences of the Universities of Ghent and Liège, at the Institut von Karman, at the Faculty of Science of the University of Ghent, and at the Centre Scientifique et Technique de la Construction.

Program

1. Comparative study of national regulations

The purpose is to inform the authors of Belgian regulations about the requirements in effect in other countries with respect to reaction to fire and fireproofing.

This should permit a better assessment of the Belgian situation, so that the Belgian regulations can be brought into line with what has been recognized as valid in the regulations of other countries. The study takes in the principal Common Market countries, Sweden, the United States and Canada.

2. Fire resistance of floors

Twelve tests on floors are under way.

The purpose of these tests is to examine fire resistance in floors prestressed by non-adherent cables, to test different

IVK : Institut von Karman

types of floors with concealed metal formwork, and to test floors in reinforced concrete with variable moment at fixed ends.

3. Fire Resistance of prestressed reinforcing

The purposes are:

- to study prestressed reinforcing in the temperature range of 100° to 200°C. In some cases an increase in resistance at these temperatures has been observed, which is favourable to fire-proofing.
- to study the characteristics of the reinforcing after heating, by tests which allow heat distortions and creep distortions to be measured separately. Creep durations are one and thirty minutes. These tests should allow a better assessment of the chances of reusing prestressed components which have been subjected to fire.
- to study the maximum expansion of the reinforcing. It has been observed in a previous study that the maximum expansion at the breaking point increases noticeably when the speed of heating decreases. The resistance of a prestressed component may be affected by excessive expansion, and it is therefore necessary to study the variation in maximum expansion in relation to different speeds of heating.
- to study, using a bibliographic and synthetic approach, the possibility of creating a complete physical model of the effect of fire on prestressed components in various sections and

structures. This could result in practical instructions and recommendations, and rules for design and construction of prestressed components for applications in which there is a risk of fire.

4. Fire resistance of load-bearing sandwich panels

The purpose is to examine fire resistance of sandwich panels used in flooring which have a "self-extinguishing" isocyanide foam placed between the sheets. The test load is 400 kg/m^2 . Similar panels are tested in wall applications, with a load of $2,000 \text{ kg/m}^2$.

5. Influence of expansion on fire resistance of statically indetermined structures

In order to create true "fire engineering", it is necessary to study the fire resistance of complete structures, and not simply that of isostatic components.

This study is an attempt to approach such a problem, and was suggested, among other reasons, as a result of two fires in which concrete components collapsed because of expansion caused by the heat of the fire.

The purpose is to examine mathematically the heat expansion produced in different types of building:

- a single-level industrial building with various types of fastenings and joints
- a three-level building with the same fastenings and joints
- a building having prefabricated wall panels and floors

- a high-rise building having a central core with either a prefabricated façade and flexible attachment of floors to the core, or a statically indetermined skeleton poured in place.

6. Theoretical study of fire resistance of statically indetermined structures

The objectives are:

- to calculate, with the help of the computer program now developed, new types of concrete components
- to extend the calculation program to simple statically indetermined structures (continuous beams). This requires studying the influence of parameters such as creep and the redistribution of stress
- extension of the program to prestressed concrete components
- extension of the program to the calculation of small gantries (porches?)
- extension of the program to the calculation of larger structures, and development of an approximate method of resolution for this type of structure.

7. Fire resistance of a metal beam

This study is in some way an addition to a previous study in which protected but unloaded metal beams were tested.

The program consists of testing a preflexed steel-and-concrete beam by subjecting it to external pressures, which create rather high stresses in the beam.

The objectives of this test are:

- to check certain conclusions obtained in previous studies, and especially to check the mathematical program of the preceding study
- to examine the behaviour of concrete where stresses vary with the position around the beam
- to examine the behaviour of AE 36 steel when subjected to very severe stresses.

8. Study of the effect of fire on a prefabricated concrete structure

This study constitutes the completion of a large full-scale experiment in which fire was simulated in an industrial building of prefabricated concrete, specially erected for the experiment.

In the present two-year period, the study consists of completing the analysis of the measurements made during the simulated fire (temperature and deformation), and carrying out a series of destructive and non-destructive tests on the concrete materials and components taken from the burnt building.

We hope to be able to deduce practical information concerning the danger of fire in prefabricated buildings and the effect of fire on the different types of concrete used in their construction.

9. Reaction of construction materials to fire

This constitutes the completion of a study in which 140 materials of all kinds (plastics, wood, textiles, paints, glass, and asphalt products, paper, and so on) were tested in order to

verify the applicability of a certain test method which was to be standardized (preliminary project 713-030 of the NBN). In this two-year period, previous results are being analysed and a series of additional tests carried out to find the cause of some apparently inexplicable results.

10. Toxicity of fumes

This study is the continuation of a previous one in which 24 combustible materials were burned in an enclosed area; laboratory animals placed in this area breathed in the combustion gases and fumes coming from the test samples. Two new test temperatures have been added in the present two-year period, since it had been observed that the toxicity of materials varied with temperature. New parameters have been introduced into the study, notably the flow of air, which can be varied.

If conclusive results cannot be arrived at by the end of this two-year period, new tests will be necessary, with more materials and new test parameters. It may finally be possible to determine a critical threshold of toxicity for each material.

11. Study of smoke evacuation

This study is intended in part to give builders and designers practical recommendations on the design and construction of air conditioning systems, with regard to their role in clearing a building of smoke during a fire.

The goals of the experimental part of this study are:

- to study pressurization of the emergency stairway
(instead of pressurization of the air lock, as in the previous study)
- to study the effect of a moderate rise in temperature (about 40°C) on the movement of air and fumes
- to study the concentration of tracer gas in the emergency stairway, when the tracer gas is produced in a burning room.

The non-experimental part of the study includes the following objectives:

- to compile a bibliography of research on smoke evacuation done in numerous industrialized countries, and of the regulations in effect or planned in these countries
- to establish practical recommendations as to design, calculation, and construction of air conditioning systems, in relation to their role in clearing a building of smoke during a fire and preventing its spreading to evacuation routes and stairways.

12. Fire resistance of fire valves

The objective is to establish a standardized test method for measuring fire resistance in fire valves.

A number of tests on fire valves are still to be carried out, using a specially-constructed oven in which a high static over-pressure is created (about 30 mm of C.E.(?)).

13. Fire resistance of protected metal sections

In this study, the behaviour of different protectives used in the previous study is examined with reference to the effect of time and aging; the protectives used should continue to be effective during a fire, even many years after the building is put into use.

Summary of Decisions re Classification of ProjectsA. Existing Projects

	<u>Category</u>	<u>Lead Department</u>
2. Design of Automated Power Distribution Substation by Laborelec (Project ALPES) (direct contact between IREQ and Laborelec).	Ongoing	IT&C
3. Steel Industry - Automation and Pollution Control (leave to companies to pursue)	Ongoing	IT&C
4. Welding Techniques (contacts established)	Ongoing	IT&C
5. a) Fiber Optics (Canadian companies not interested in pursuing at present)	Drop	
b) Lasers (no mutual interests identified)	Hold	
6. Housing Construction Systems (one Canadian company pursuing licensing prospect)	For further examination in the framework of the New Belgian proposal (See B(e) page 2)	
7. Asbestos Based Products (agreed with Belgians not to pursue further)	Drop	
8. Uses of Sulphur (no Belgian interest)	Drop	
9. New Technologies in Metal Forming (Canadian side unable to identify interested companies)	Drop	
10. Ion Exchange Membranes (Belgian company no longer interested)	Drop	
11. Use of Plasmas in Production of Metal By-Products (Belgian company no longer interested)	Drop	
12. Computer-Aided Design of Mechanical Structures (still trying to identify areas of mutual interest)	Ongoing	IT&C
13. Production of Propylene Oxide and Ammonia (interested Canadian companies not identified)	Drop	

Note: It was agreed to transfer "Harnessing of Solar Energy" to the Energy Group, and it was noted that the exchange of papers on "Systems of Information for Foreign Trade" had been completed.

B. New Topics

I. Proposed by Belgium

a. Cobalt and Nickel - Based High Performance Alloys

IT&C will take the lead role and consult with NRC and EM&R. It was agreed to provide some research papers to Belgian Side, to which they will respond if Canadian research undertakings appear to be of interest.

b. Textile Technology

As there is no similar center in Canada, it appears difficult to find areas for cooperation. However, IT&C will examine further Section 4.4 and report in a few months.

c. Glass Technology

It was noted that this was an offer by a Belgian company. IT&C agreed to accept the lead and will consult the Ontario Research Foundation (Dr. Murphy) with whom Glaverbel have been previously in contact.

d. Recycling of Plastics

IT&C agreed to act as focus for consultations with Departments of Environment and Energy, Mines and Resources, as well as Polysar.

e. Industrialization of Building Construction

NRC agreed to take the lead role and report to Belgium after consultations with IT&C and CMHC.

f. Fire Prevention Technology

NRC to take the lead role.

g. & h. Assistance to Small Companies

NRC will take the lead in providing Belgium with information on Canadian programs, including the problem aspects of efforts to assist small companies.

B. New Topics

II. Proposed by Canada

Exploitation of Rapid Test for Catalase

IT&C provided additional background information and IRSIA and Ministry of Health agreed to take the lead role and follow up.

PARTICIPATING COUNTRIES: BELGIUM

LEAD CANADIAN AGENCY: DEPARTMENT OF INDUSTRY, TRADE AND COMMERCE

OTHER INTERESTED CANADIAN
AGENCIES: AGRICULTURE, HEALTH AND WELFARE

RESPONSIBLE INDIVIDUAL: R. E. POMFRET

ADDRESS: OFFICE OF SCIENCE AND TECHNOLOGY (61)
IT&C, OTTAWA, K1A 0M5

TELEPHONE: 996-3416

FOREIGN AGENCY (KNOWN
OR POSSIBLE): _____

PROJECT TITLE: EXPLOITATION OF RAPID TEST FOR CATALASE

PRIMARY OBJECTIVE OF
PROJECT: TO ESTABLISH THE USEFULNESS OF RAPID CATALASE
DETERMINATIONS AS QUALITY CONTROL AND MEDICAL
DIAGNOSTIC PROCEDURES.

PROJECT DESCRIPTION:

Dr. Marcel Gagnon of the Centre des recherches en sciences appliquées à l'alimentation (CRESALA) of the Université du Québec à Montreal has pioneered the development of a rapid, analytical test for the enzyme Catalase. This new test procedure is quick and simple to perform and gives greater accuracy than the cumbersome and tedious Thomson test procedure.

A simple instrument for performing the test has been developed by CRESALA and is being manufactured and marketed by Allca Instruments Co. Ltd., 1045 Ouest, rue Laurier, Montreal, Canada. However, it is not necessary to have the instrument in order to perform the test, any reasonably equipped laboratory can assemble suitable apparatus very simply.

Catalase is present in many vegetable and animal fluids in amounts that depend upon the purity or health of the vegetable or animal respectively. A simple, rapid test for catalase opens the possibility of introducing simple but effective (a) quality control procedures in, for example, the blanching of vegetables prior to freezing for storage, and (b) diagnostic procedures for use in hospitals and medical centres. Such quality control and diagnostic procedures have not been used in the past due to the difficulty and tediousness of the accepted standard test.

The interest of Belgian food technologists and medical doctors in exploring the utility of the new test method for routine quality control or diagnostic purposes is solicited. Additional descriptive material is attached.

PRESS RELEASE

What are catalasymeter and catalase?

This is a new and exciting reality, full of promise for food growing ... and for medicine.

Catalase is an enzyme whose content in canned foods must be controlled at all costs, if product quality is not to be compromised and shelf life dangerously shortened. This observation is not new: in 1819 researchers discovered the influence of this enzyme in all living matter, and its importance for the metabolic balance and health of human and animal species.

In 1959 the founder and director of the Centre de recherche en sciences appliquées à l'alimentation of the University of Quebec at Montreal, Dr. Marcel Gagnon, was invited, during a visit to the University of Massachusetts, to do research on a procedure to speed up the tests for measuring the effectiveness of a treatment given to vegetables before canning.

This research has resulted in a method for measuring catalase using flotation of a disk which instantly indicates presence of the enzyme in a hydrogen peroxide solution, and which at the same time indicates the relative quantity present by the amount of time the disk takes to rise to the surface of the liquid in a test tube, taking into account the number of gaseous bubbles adhering to a paper disk.

Dr. Gagnon's method, published in scientific journals, has been accepted by various researchers throughout the world: by Americans in 1965, to detect poor quality milk; in 1968 by Italian

researchers, who confirmed the validity of this detection process; in 1964 in Japan, where an article revealed that detection of catalase activity in some patients was a determining factor in sorting out healthy persons from those affected by cancer. Later, in 1967, a researcher named Lie demonstrated that results revealed by catalase identified specific kidney ailments, such as reticulosis, kidney stones, and others.

Based on these observations and on the numerous possible applications of catalase detection by the disk method, the director of CRESALA and various co-researchers have set themselves two priority objectives:

1. to find a faster and more accurate measuring system for the disk flotation method of detection. An instrument for this purpose has been developed by specialists in electronic physics at UQAM;
2. to use this new instrument in our own medical and hospital circles to verify data revealed by the Japanese and American studies regarding the value of the method in detecting the presence or absence of cancer in patients, and its capacity for fast detection of kidney infections through urine analysis, either at the hospital or even in the doctor's office.

Thus, starting from an improvement of a method developed to check the quantity of catalase present in vegetables being blanched for canning, a serendipitous miracle has given CRESALA valuable data, resulting in a method for rapid, semi-automatic measurement of catalase, and an

instrument called the "catalasimèter" (R), invented by CRESALA to serve the cause of medical science at greatly reduced research costs and permit the large-scale detection of numerous illnesses. Experiments currently being carried out in Montreal, especially in the field of cancer research, increasingly confirm the validity of this new detection process. UQAM has been able to sign a contract with Allca Instruments Inc of Montreal for the manufacture and world distribution of the catalasimeter.

Catalase Application

(dated November 6th, 1973)

1. Vegetables

- 1.1 Blanching
- 1.2 Bacterial flora
- 1.3 Others

2. Bacteriology

- 2.1 Coliform
- 2.2 Coliform faecalis
- 2.3 Staphylococcus
- 2.4 Salmonella
- 2.5 Gonococcus
- 2.6 Others

3. Medicine

- 3.1 Human
 - 3.1.1 Urinary infection
 - 3.1.2 Kidney stone
 - 3.1.3 Gonorrhoea
 - 3.1.4 Mastitis
 - 3.1.5 Tuberculosis drug-resistant bacteria
 - 3.1.6 Cancer detection
 - 3.1.7 Public health screening - staphylococcus
- salmonella
 - 3.1.8 Others

3.2 Veterinary

3.2.1 Mastitis

3.2.2 Urinary

3.2.3 Others

4. Industrial Application

4.1 Bacteriological quality control

4.2 Antibiotic or other inhibitors in milk and meat products

4.3 Blanching

4.4 Sanitation

CO-OPERATION ON ENVIRONMENT AND RELATED SUBJECTS

A. Water management

The exchange of reports previously planned in the following fields has now taken place:

- use of models in fresh water management (Canada)
- sea and estuarial waters

A meeting of experts took place in Belgium in June, 1975. It discussed analytical methods relative to the application of models and the methodology of application.

The two sides identified gaps in the data needed to develop an overall model.

- Three Quebec experts made a planned visit to Belgium and met with specialists in fresh water research and management.

The meeting was described in a Quebec report which was distributed.

- The contacts planned with regard to humic acids in the aquatic environment have taken place. (No action is being taken for the present.)

B. Air pollution

The planned exchange of reports has also taken place on this subject.

- Canada has passed on reports on the detection and monitoring of air pollution.
- The Belgian national program of research and development on air

pollution was begun by the government in 1975; the Belgian delegation was thus able to communicate information announced in previous meetings.

C. Discharge of petroleum products onto water surfaces

- Canada has passed on a report on certain counter-measures.
- Belgium has passed on a detailed technical report on predictive analysis of movements.

D. Solid wastes

- Canada has passed on the information announced on solid wastes.

PROPOSALS FOR CO-OPERATION IN THE PUBLIC HEALTH

FIELD MADE BY THE QUEBEC REPRESENTATIVES

During a mission to Belgium in January 1975, representatives of the Quebec Department of Social Affairs were able, through visits to health institutions, to evaluate the quality of research and health care.

They came back with the conviction that Quebec could benefit from Belgium's experience and progress in the fields of toxicology and occupational medicine, in pharmacology and in geriatrics, and that Belgium would also be interested in the research done in Quebec in toxicology, since the Belgian and Quebec experiments in this field were complementary.

Consequently, co-operative activity in the following sectors was proposed:

A. Clinical toxicology

1. Documentation It is desirable to take advantage of Belgian experience in this area, which is much more extensive than our own, particularly now when the need for reorganization in this field is being felt in Canada.

2. Analytical toxicology In this sector, Quebec has set up laboratories which are fully integrated into the poison control and industrial toxicology programs. Belgium seems to be directing its efforts along the same lines, which is why co-operation seems desirable.

3. Epidemiology of poisoning Belgium participates actively in a European program for setting up drug reaction and poison control centres. Organizing a similar system here would pose many problems which the Belgian experience could help us to solve.

4. Data processing applied to industrial toxicology Quebec is setting up a computerized program to monitor workers liable to poisoning at their place of work; Belgium may be interested in this experiment.

5. Industrial medicine Knowledge of Belgian progress in the field of occupational medicine would be useful to us in teaching, legislation and organization of services.

6. Clinical pharmacology This sector has made great strides in the last ten years, both at the federal and provincial levels.

Medical data processing has played an important role in the growth of this sector. Our experience may be useful to our Belgian partners.

7. Procedures for co-operation It is desirable to arrange an exchange of documentation in these sectors, then an exchange of students for training periods of 3, 6 or 12 months, as well as exchanges of professors and researchers.

B. Geriatrics

The members of the Quebec mission which visited health institutions in Belgium in January 1975 were highly impressed by the conception behind the care offered, as well as the planning of senior citizens' residences.

It has recently been agreed to give this sector priority attention, both in Canada and in Quebec.

As a result, the Quebec authorities would like to arrange study periods in Belgium for the medical, paramedical and administrative staff responsible for designing and carrying out geriatrics programs.

C. Emergency system

The members of the Quebec mission also noted the effectiveness of System 900, which provided integrated ambulance, police and fire protection services.

For some time the Quebec authorities have felt the need to organize a similar system. In this connection, they have suggested sending a multidisciplinary technical and administrative mission to Belgium.

CO-OPERATION IN THE FIELD OF ENERGY RESEARCH AND DEVELOPMENT

BELGIAN NATIONAL PROGRAM OF ENERGY RESEARCH AND DEVELOPMENT

On June 27, the Belgian government adopted a national incentive program for research and development in non-nuclear energy. A study of "waste material economy" will shortly be added to this program.

As in other national programs, the aim is to supply information intended to aid in political decision-making. The essential concerns basic to the program are as follows:

- to identify scientific criteria for a more rational use of energy in the various sectors of the national economy
- to increase the number and variety of solutions which can be used to reduce the country's energy dependence
- to assess the economic and social effects of various new energy techniques and solutions likely to improve the country's future position.
- to develop the data and evaluation tools which will enable the country to identify in time the scientifically and technically feasible medium and long-term options open to it in the field of energy.

The program is centred on the following areas:

- a) Development of models to provide a better knowledge of the national energy system and to predict its future development.
- b) Energy saving: an initial study consists of a systematic examination of the problems involved in recovering lost or dissipated

heat; in new proposals to be made to Cabinet, research is planned in production of energy by processing of wastes.

- c) Fossil energy: evaluation studies will centre on new processes for treatment of coal - distillation, liquefaction.
- d) Non-conventional energy: research will centre on the use of solar energy to produce electricity and for heating.

Research will begin in September 1975 and will last three years. Nine universities or university centres, various public authorities and private centres will participate in the program, which has a budget of 244 million Belgian francs for three years.

In connection with the topics of this program, the Belgian delegation would be interested in gathering information on the following points:

- energy saving in industrial processes
- urban heating
- use of heat pumps
- wind energy
- processing of urban and agricultural wastes to produce energy
- use of solar energy
- methodology of developing national energy models.

PARTICIPATING COUNTRIES: Canada and Belgium

LEAD CANADIAN AGENCY: Parks Canada (INA)

OTHER INTERESTED CANADIAN AGENCIES: DPW, MSUA

RESPONSIBLE INDIVIDUAL: Peter H. Bennett, Coordinator, Liaison and Consultation

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TELEPHONE: 996-1077

FOREIGN AGENCY (KNOWN OR POSSIBLE): Belgian Ministries of Cultural Affairs (both Flemish and Walloon)

PROJECT TITLE: Canada-Belgium Committee on Historic Conservation

PRIMARY OBJECTIVE OF PROJECT: To develop a system of exchanges of information, technical reports and where desirable and feasible, personnel.

PROJECT DESCRIPTION: Exchanges could cover the following fields of historic conservation, amongst others:
Techniques of building restoration
Training of restoration architects, restoration engineers and artisan-craftsmen (e.g. carpenters, stonemasons, ironworkers, etc.)
bilingual interpretation techniques
historic resource inventory techniques
conservation of historic areas of cities and towns
exchanges of personnel
exchanges of technical papers and reports.

The Committee could meet once a year or as required with each country in turn hosting a meeting.

ACTION PROPOSED: Meetings between appropriate senior Canadian and Belgian personnel to discuss committee concept in more detail, establish its terms of reference and examine fields of historic conservation in which it might usefully operate.

PROPOSAL FOR INTER-UNIVERSITY CO-OPERATION
ON THE EVALUATION AND UPGRADING OF UNIVERSITY RESEARCH

Submitted by the Quebec representatives

The University of Quebec, as part of its general research policy, has set itself the special objective of evaluating and upgrading its activities in this field, in order to verify their coherence and their relevance to the stated goals, as well as their contribution to the socio-economic development of the community of which the university is a part.

The University of Quebec is interested in the experience of the Katholieke Universiteit Leuven (Dutch-language Catholic University of Louvain) in industrial upgrading of university research, and by the Université Catholique de Louvain (French-language Catholic University of Louvain) in research evaluation methodology. The University of Quebec would like to work with these two institutions.

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