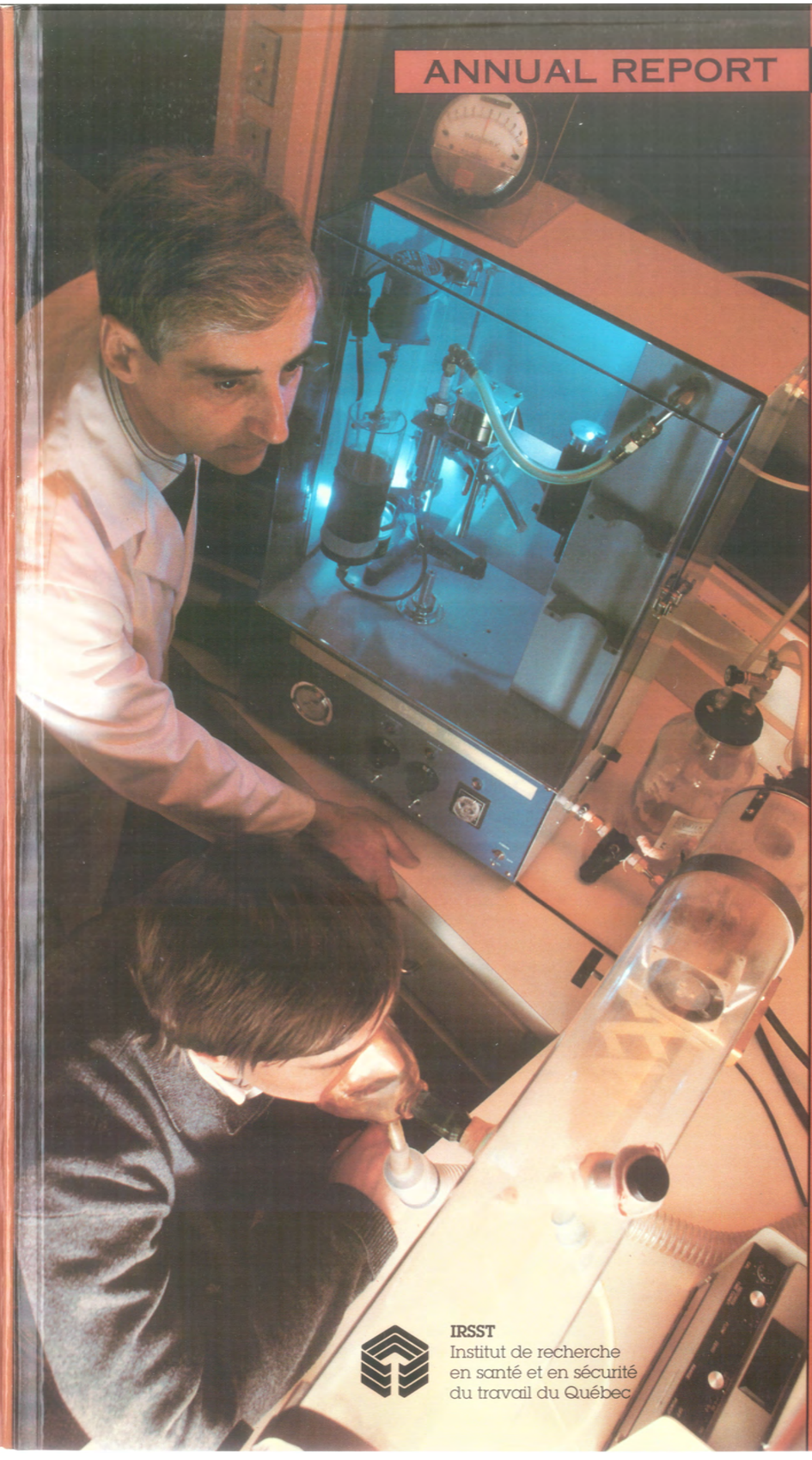
ANNUAL REPORT 1990

IRSST

Ten years of research for the working community



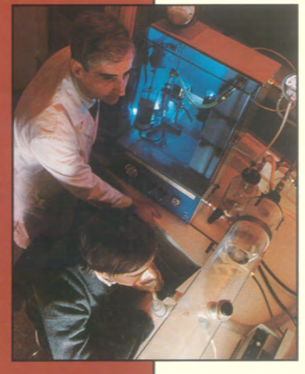
IRSST
Institut de recherche
en santé et en sécurité
du travail du Québec

MISSION AND OBJECTIVES

The Institut de recherche en santé et en sécurité du travail du Québec (IRSST, Québec Occupational Health and Safety Research Institute) was created in 1980. Its mission is to contribute through scientific research to the identification and elimination at their source of occupational hazards, and to the rehabilitation of workers injured by these hazards.

The Institute fulfils its mission by:

- performing, contracting, and funding research reflecting the needs of the working community;
- providing laboratory and consulting services to the Québec occupational health and safety prevention network;
- communicating the knowledge gleaned from its research activities to the working community;
- awarding graduate scholarships in occupational health and safety.



An exposure system designed and patented by the IRSST's Laboratory Division is now used by lung specialists at the Hôpital du Sacré-Coeur de Montréal to diagnose dust-induced occupational asthma without endangering patients or hospital staff. The use of a similar system for the diagnosis of isocyanate-induced asthma is currently being evaluated. Once automated, the two instruments will be commercially marketed.

IRSST
Institut de recherche en santé et en sécurité du travail du Québec

505, boul. de Maisonneuve ouest
Montréal (Québec)
H3A 3C2
(514) 288-1551

Legal deposit
Bibliothèque nationale du Québec
2nd quarter 1991
ISBN : 2-550-21631-8
ISSN : 0820-8409

Design and coordination
Communication Division, IRSST

Chairman's message 2

Report of the Chief Executive Officer 3

Highlights
- Research activities 4
- Consultation 10
- Research applications transfer 11
- Special events 12

Board of Directors 14

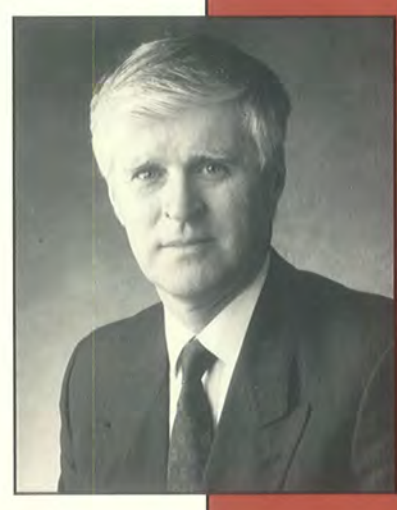
Scientific Advisory Board 16

Administrative report
- Personnel 18
- Organizational structure 18
- Funding 19
- Research activities 19
- Services 20
- Communications 20

Financial report 21

REPORT OF THE CHIEF EXECUTIVE OFFICER

During the course of the past year, I was called upon to succeed Louis Berlinguet as Chief Executive Officer of the Institute. I would like to commence this report by underlining the dynamism and determination shown by my predecessor in directing our organization. As a result of his vision and expertise, the IRSST enlarged its horizons and set priorities reflecting the needs of the working community.



I accepted this position with enthusiasm. Having been associated with the IRSST since its creation, I helped develop policies which established our credibility in both the scientific and working communities. However, this success is clearly a product of the people who form the occupational health and safety research community, both inside and outside of Institute walls.

Throughout the term of my mandate, I plan to emphasize the strengthening of ties between the research and working communities. The Institute must act as a bridge between these two worlds, sensitizing each to the constraints of the other, informing each of their possible and necessary contributions, and acting, in brief, as a facilitator of fruitful dialogues. This leadership role can only lead to a better balance between the expectations of the working community and the responses resulting from research.

Over the last ten years, the Institute has given certain research themes high priority. However, the vastness of the discipline has meant that certain areas have barely been explored to date. Given our limited resources on the one hand, and the virtually unlimited number of problems to be addressed on the other, I feel it essential to make realistic choices which respond to the most pressing needs. Our grouping of research projects under a small number of priority themes allows us to achieve significant scientific breakthroughs. To ensure that these breakthroughs lead to improvements in occupational health and safety, our efforts at ensuring the concrete application of our results must at least continue at their present level, if not intensify.

The Institute's ability to achieve its goals rests in its ability to mobilize, and acquire the support of, the scientific and technical resources available to it internally and externally. More than ever, their contribution will be a decisive factor. While we have now come of age, it must be realized that the complex problems on the horizon will demand much of us. From now on, it will be necessary to continually do more, embrace multidisciplinarity, strengthen our ties with foreign colleagues, and ensure that all our activities — be they in the fields of research, service, or consultation — remain faithful to our primary mission.

Jean Yves Savoie,

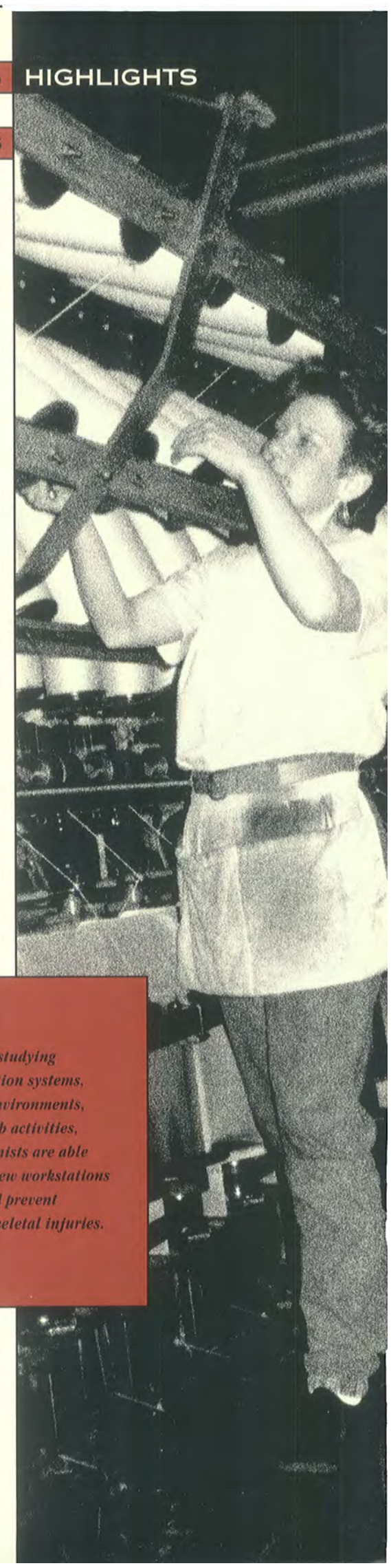
Chief Executive Officer

REPETITIVE-MOTION INJURIES

The health effects of repetitive motion have become an increasingly important research area, as it has been estimated that musculoskeletal injuries caused by such motion may represent some 50% of all compensated injuries in ten years.

This year saw the launching of four new projects in this field. In the first phase of a national project aimed at collating current scientific knowledge concerning repetitive-motion injuries, Institute researchers performed a literature review of the field. The approximately 1 500 publications examined were computerized and categorized to create a research and prevention database.

In other activities, IRSST ergonomists are studying the causes and effects of repetitive motion in chicken slaughterhouses, analyzing a relationship between accidents and processes in carpet factories and the characteristics of the working populations, and investigating musculoskeletal injuries caused by repetitive motion in pork slaughterhouses.

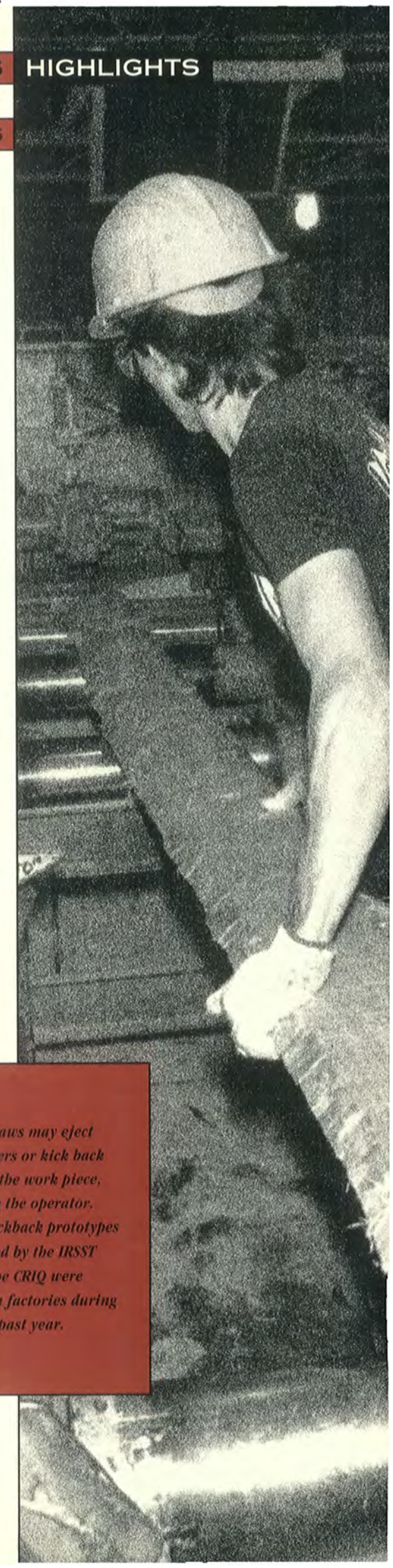


By studying production systems, work environments, and job activities, ergonomists are able to design new workstations and prevent musculoskeletal injuries.

DANGEROUS INDUSTRIAL MACHINES

This year, engineers from the IRSST and the Centre de recherche industrielle du Québec (CRIQ) put the finishing touches on an anti-kickback system which will reduce wood ejection during radial saw operation in the furniture and woodworking sector. Following observations in some ten factories, an experimental model was produced, laboratory-tested to optimize various design parameters, and validated in factories. Plans and cost estimates for a preproduction prototype are now being prepared. The same methodology was applied to the problem of radial saws in sawmills, and the results obtained will be used to establish production, maintenance, and operation procedures.

Other related projects initiated at the Institute in 1990 included a study, with prevention-related recommendations, of the factors contributing to accidents involving metal presses, and the development of a range-limiting device designed to reduce collisions between crane arms and electrical power lines, and the resultant electrocutions. This latter device could eventually be adapted to other equipment, such as cement pumps and truck beams, which also present the same worker hazards.



Radial saws may eject wood slivers or kick back pieces of the work piece, injuring the operator. Two anti-kickback prototypes developed by the IRSST and the CRIQ were validated in factories during the past year.

RESEARCH ACTIVITIES HIGHLIGHTS

SOCIAL SCIENCES

The descriptive and prospective analysis of the state of health of Québec workers, begun in 1989 using data from the Santé-Québec survey, is one of the more noteworthy Institute research projects in the social sciences. The results of this study will allow the Institute to develop social and health-related indices based on the entire active population, rather than only on workers compensated by the CSST.

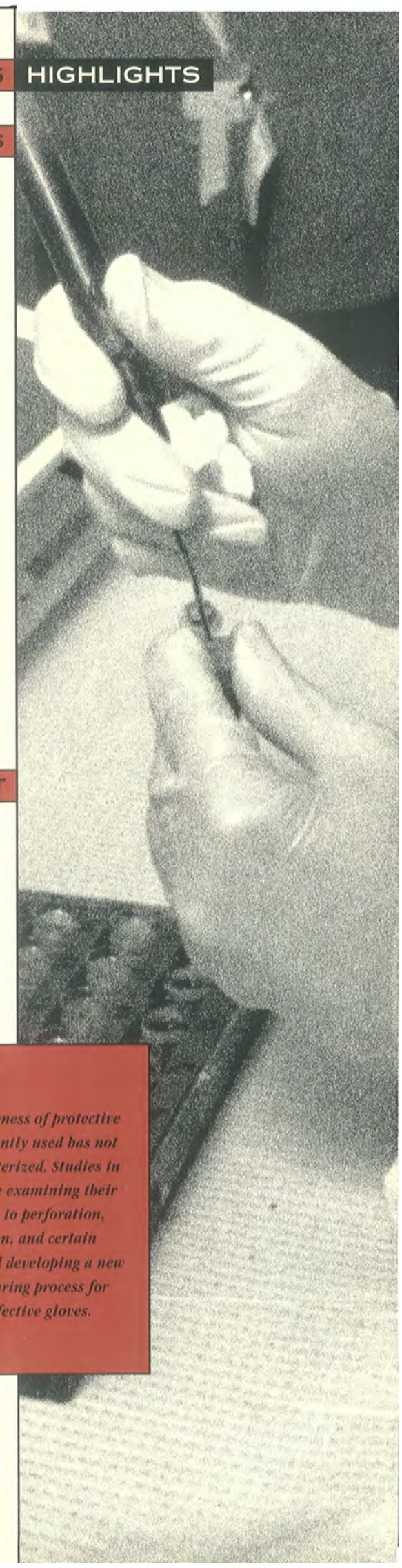
Analysis of work on board fishing boats continued at the Université du Québec à Rimouski. Following evaluation and testing of safety equipment liable to reduce accidents, a training manual dealing with prevention was prepared for fishermen, and a technical safety guide was established for the fishing community.

Finally, the study in progress on hand injuries in metal fabricating industries has characterized the main problems associated with these injuries, namely the technical characteristics of production and the training and supervision needs of the workers.

PERSONAL PROTECTIVE EQUIPMENT

IRSST research on the resistance of protective gloves continued. Five models of gloves were tested and their resistance to laceration and perforation evaluated. The second phase of this project is examining the solvent resistance of commercially available protective gloves.

In other areas, a researcher at the École Polytechnique de Montréal applied co-extrusion techniques to fabricate a multilayer material resistant to styrene and methylene chloride. The conditions necessary to apply this process to the large-scale production of gloves of this material were then determined. Negotiations for the commercial production of the gloves designed in this research project are under way with a manufacturer. This should lead to effective and relatively inexpensive protective equipment being available to workers exposed to solvents.



The effectiveness of protective gloves currently used has not been characterized. Studies in progress are examining their resistance to perforation, laceration, and certain solvents, and developing a new manufacturing process for more effective gloves.

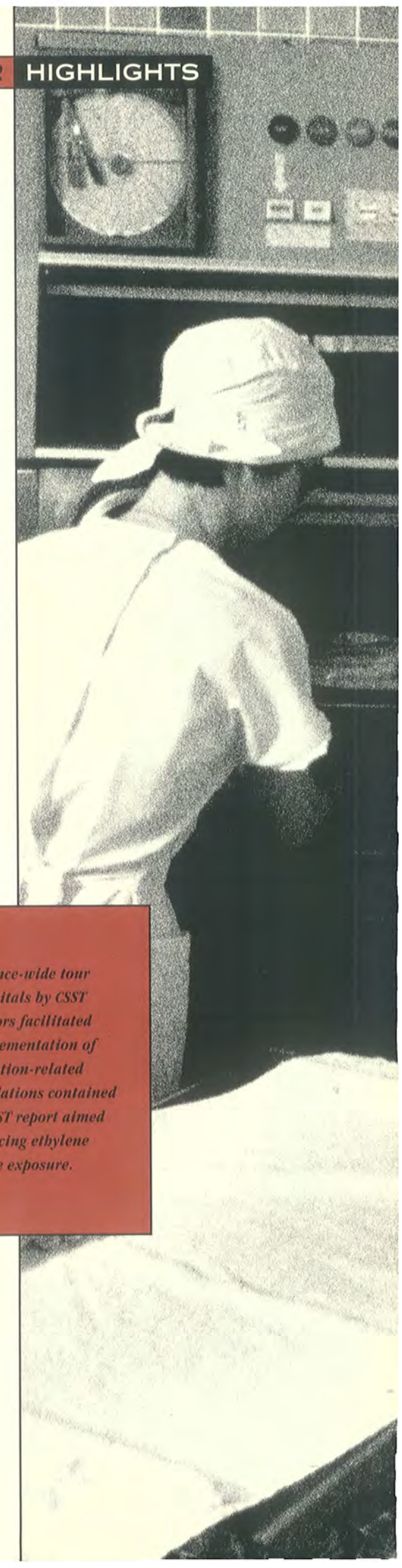
A marketing agreement was entered into with the Cogesis group of Montréal, for the marketing and distribution of the software package developed by the Institute for the collection and analysis of data on accidents related to back disorders in hospitals. The software will be marketed under the name PREVAM.

Other products designed at the Institute will soon been marketed. Plans and cost estimates have been drawn up for the mass-production of the anti-kickback devices developed to eliminate the kick-back of pieces of wood and ejection of wooden slivers from radial saws used in the furniture and woodworking industries, and negotiations are under way for the marketing of these safety devices.

Similarly, the dust and isocyanate exposure systems developed at the IRSST will be automatized and commercially produced by a manufacturer. The dust exposure has already been validated as a diagnostic tool for occupational asthma, while the isocyanate exposure system is undergoing validation.

The results of the study on the relationship between patrol-vehicle design and back injuries in police officers have already found concrete application, as participants in the research project have implemented some of the modifications recommended in the report. In addition, the various research partners are working in conjunction with standardization agencies to ensure that the criteria proposed in the study are respected and will be sensitizing the major car manufacturers to the specific needs of police forces.

Finally, in a joint effort by the Institute, the CSST, and the Association de la santé et de la sécurité du travail — secteur des Affaires sociales (ASSTAS, Joint Occupational Health and Safety Association, Social Affairs Sector), CSST inspectors have carried out a province-wide tour of hospitals to promote the application of recommendations contained in the prevention guides developed from IRSST research on the use of ethylene oxide, nitrous oxide, and formaldehyde.



A province-wide tour of hospitals by CSST inspectors facilitated the implementation of prevention-related recommendations contained in an IRSST report aimed at reducing ethylene oxide exposure.

In other activities in the field of indoor air quality, the IRSST hosted the third of six North Atlantic Treaty Organization (NATO) meetings uniting 32 scientific experts from ten NATO member countries. Proceedings of the meeting, including provisional recommendations, were published by the Institute. The final report, to be distributed to NATO members in 1992, after the last of the six meetings is held, will summarize the state of scientific research on indoor air quality and the areas of consensus of the committee members and formulate corrective and preventive measures.

Finally, the Institute has taken the initiative of holding multidisciplinary workshops bringing together researchers in various fields, in order to better define possible orientations and developments, and improve coordination of research activities. For example, a mini-workshop on back disorders afforded some 30 doctors, demographers, engineers, ergonomists, epidemiologists, and statisticians the opportunity to exchange information in their fields of expertise.

Similar workshops were held on other topics, including repetitive-motion-induced musculoskeletal injuries, new technologies, and occupational health and safety research and development in small and medium-sized companies.

BOARD OF DIRECTORS

Céline Lamontagne
Third Vice President
Confédération des syndicats nationaux

Jean Lavallée
Director General and Financial Secretary
Fraternité inter-provinciale des ouvriers en électricité
(Interprovincial Brotherhood of Electrical Workers)
Vice President, Fédération des travailleurs
et des travailleuses du Québec

Claude Morrisseau
Regional Director
Canadian Union of Public Employees
Vice President, Fédération des travailleurs
et des travailleuses du Québec

CHIEF EXECUTIVE OFFICER*

Jean Yves Savoie[1]

SCIENTIFIC DIRECTOR*

Vacant[2]

OBSERVER*

Marc Dionne
Director of Public Health,
for the ministre de la santé
et des services sociaux du Québec
(Minister of Health and Social Services)

DEPARTURES DURING 1990

Louis Berlinguet
Chief Executive Officer
Institut de recherche en santé
et en sécurité du travail du Québec

Guy Dufresne
President and Head of Operations
Kruger Inc.

Jean-Marc Turcotte
President and Chief Executive Officer
Tioxide Canada Inc.

EXECUTIVE COMMITTEE

Robert Diamant
President

Ghislain Dufour

Louis Laberge

Jean Yves Savoie*[1]

---

[1] Position held by Louis Berlinguet until November 29, 1990.
[2] Position held by Jean Yves Savoie until November 29, 1990.
* Non-voting member

SCIENTIFIC ADVISORY BOARD

WORKER REPRESENTATIVES

André Forest
Coordinator, Occupational
Health and Safety
Construction unions
Fédération des travailleurs
et des travailleuses du Québec

Charles Prévost
Union consultant
Industrial Engineering
Confédération des syndicats nationaux

Monique Simard
First Vice President
Confédération des syndicats nationaux

Serge Trudel
Director, Occupational Health and Safety
Fédération des travailleurs
et des travailleuses du Québec

MEMBERS REPRESENTING THE SCIENTIFIC COMMUNITY

Charles E. Beaulieu
President and Chief Executive Officer
Institut national d'optique
(National Optics Institute)

Madeleine Blanchet
President
Conseil des affaires sociales
et de la famille
(Family and Social Affairs Council)

Maurice Brossard
Vice President, Biotechnology
National Research Council of Canada
Chief Executive Officer
Biotechnology Research Institute

Maurice L'Abbé
Research Office
Université de Montréal

Jean-Marie Toulouse
McLean-Hunter Professor
of Entrepreneurship
École des Hautes Études Commerciales
de Montréal

DEPARTURES DURING 1990

Louis Berlinguet
Chief Executive Officer
Institut de recherche en santé
et en sécurité du travail du Québec

Clifford Nelson Baronet
Executive Vice President, Research
and Development,
Centre de recherche industrielle du Québec
(Québec Industrial Research Centre)

FUNDING

Total revenue for the IRSST in 1990 was $17,906,112, including a grant of $15,154,862 from the CSST. Expenditures were $17,733,583.

Figure 1
Revenue: $17,906,112 = 100%

Figure 2
Expenditures: $17,733,583 = 100%

RESEARCH ACTIVITIES

In 1990, internal and external researchers conducted 112 research and consulting projects. Of these, 36 began, 56 continued, and 20 were completed in 1990. A list and a summary of all projects active in 1990 appear in a supplementary report available in French.

The Institute allocated $6,510,811 to its internal research programmes in 1990 and $4,323,969 to its external research programmes. The distribution of external research funding is as follows:

- External research groups $2,217,116
- Contracted and funded research $1,769,052
- Graduate scholarships $ 337,801

Through its Researcher Training Programme, the Institute awarded scholarships to 1 post-doctoral fellow, 9 doctoral students, and 12 master's students working in high-priority research fields.

AUDITORS' REPORT

To the members of
The Québec Occupational Health and
Safety Research Institute

We have audited the balance sheet of the Québec Occupational Health and Safety Research Institute as of December 31, 1990 and the statements of revenues and expenses and balances of funds for the year then ended. These financial statements are the responsibility of the Institute's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance that the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statement. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the Institute as of December 31, 1990 and the results of its operations for the year then ended in accordance with generally accepted accounting principles.

SAMSON BÉLAIR / DELOITTE & TOUCHE
Chartered Accountants

March 1, 1991

FINANCIAL REPORT

REVENUES AND EXPENSES

(year ended December 31, 1990)

RESTRICTED FUND

	1990	1989
Revenues		
Outside contracts	**$449,568**	$325,992
Interest	**572**	403
	450,140	326,395
Expenses		
Remuneration		
Salaries	**275,939**	260,034
Fringe benefits	**37,166**	34,324
Staff training and upgrading of skills	**190**	—
	313,295	294,358
Postage and travel	**840**	636
Travel	**15,166**	7,602
Analysis	**6,746**	16,193
Sub-contracts	**22,446**	12,353
Fixed assets	**110,993**	54,192
	469,486	385,334
Excess of expenses, transferred to balance of fund	**$ 19,346**	$ 58,939

FINANCIAL REPORT

BALANCE SHEET

(as of December 31, 1990)

OPERATING FUND

	1990	1989
Current assets		
Cash	$ 84,497	$ 880,833
Accounts receivable (note 6)	502,069	908,395
Inventories	56,704	86,834
Prepaid expenses	40,716	51,208
Due from restricted fund	—	141,369
	683,986	2,068,639
Fixed assets (note 7)	2,005,583	1,857,133
	$2,689,569	$3,925,772
Current liabilities		
Accounts payable and accrued liabilities	$ 458,619	$1,118,215
Due to restricted fund	33,492	—
Due to CSST - 1988 surplus	—	571,386
	492,111	1,689,601
Balance of fund	2,197,458	2,236,171
	$2,689,569	$3,925,772

RESTRICTED FUND

Current assets		
Deposit	$ 6,903	$ 6,331
Accounts receivable	86,281	149,251
Due from operating fund	33,492	—
Work in progress	—	85,492
	126,676	241,074
Fixed assets (note 7)	104,249	37,934
	$ 230,925	$ 279,008
Current liabilities		
Revenues received in advance	$ 46,317	—
Due to operating fund	—	141,369
	46,317	141,369
Balance of fund	184,608	137,639
	$ 230,925	$ 279,008

Commitments (note 8)

Approved by the Board of Directors

Ghislain Dufour
Louis Laberge

(year ended December 31, 1990)

4. EXPENDITURES BY ACTIVITY - OPERATING FUND

	1990	1989
Research activities		
Management and coordination	**$ 1,020,027**	$ 864,173
Administrative services	**1,308,704**	1,267,312
Research	**11,367,651**	10,645,551
Research Applications Transfer Unit	**95,650**	—
Communications	**729,535**	691,066
Computer Services Division	**669,903**	552,587
	15,191,470	14,020,689
Laboratory services to prevention network members	**2,072,627**	1,798,428
	$17,264,097	$15,819,117

5. OPERATING SURPLUS - RESTRICTED FUND

As of December 31, 1990, the commitments on their surplus amount: $79,354 .

6. ACCOUNTS RECEIVABLE

	1990	1989
Laboratory services		
CSST	**$ 423,408**	$ 806,153
Other	**62,360**	11,951
Miscellaneous		
CSST	**—**	791
Other	**16,301**	89,500
	$ 502,069	$ 908,395