

NAFTA
Occupational and
Environmental
Health Systems

Workshop Proceedings

Ottawa, Canada
March 28-30 1994

Editor: John Markham



ARCHIV
MARKHA
no. 104473

Acknowledgements

The workshop herein recorded resulted from the joint initiative of three national non-political scientific organizations: the International Development Research Centre (IDRC) at Ottawa, Canada; the National Institute of Public Health at Cuernavaca, Mexico (Dr. Mauricio Hernández); and the Institute of Medicine of the National Academy of Sciences in Washington, U.S.A. (Dr. Kenneth Shine, Dr. Polly Harrison and Dr. Christopher Howson). Dr. Maritza Tennessee, Occupational Health Consultant, attended on behalf of the Pan American Health Organization (PAHO) as an observer; this was particularly welcome because she had suggested to IDRC in 1993, the need for study of occupational health information systems in the North American Free Trade Agreement (NAFTA) countries.

We wish to express our thanks to the distinguished keynote speakers, Dr. Jorma Rantanen, Director of the Finnish Institute of Occupational Health in Helsinki and Dr. Alexandre Berlin, Advisor, Health and Safety Directorate, of the European Commission in Luxembourg, whose formal papers are attached as an appendix; and also to the participants invited by their respective national institutions for their lively, open and constructive discussion, energetic involvement over three long days and many wise comments. Their names and addresses appear directly following the Executive Summary. National and language differences were brushed aside in a shining commonality of purpose and of principles.

Lyse Lavictoire, Judith Cray, Suzanne Soroka, Susan Warren, and Michelle Charest hospitably oiled the wheels of the proceedings. Angie Anton made and changed travel plans of the participants with aplomb and efficiency. Michèle Wilson and Lucille Lalonde arranged prompt translation of text in three languages in both directions with style. Dorothy Speak showed her usual great editorial flair in a first edit of the recorded proceedings. Betty Alice and Ruth McGraw prepared and formatted this document with loving care. The quality of simultaneous interpretation in three languages during the workshop justified the warm ovation given to the Secretary of State's interpreters at its end.

The costs of the workshop held in Ottawa, and of these proceedings in English and Spanish, were met by the International Development Research Centre.

John Markham

TABLE OF CONTENTS

I	Acknowledgements	
II	Executive Summary	
III	Participant List	
IV	Introduction	1
V	Plenary Session	10
VI	World Models of Occupational and Environmental Health Systems	14
VII	National Occupational and Environmental Health Systems	
	The Canadian System	28
	The Mexican System	51
	The American System	75
VIII	Experience with Harmonization of Environmental and Occupational Health Systems in the European Union	90
IX	Future Agenda, Strategy, Projects	116
X	Proposals - Canadian and American Delegations	129
XI	Proposals, Mexican Delegation	132
XII	Reports from Group Discussions	146
XIII	Summative Comments	151
XIV	Acronyms	154
XV	Agenda	155
	Appendix	
	Occupational and Environmental Health and Safety (Chemicals) in the European Union by: A. Berlin & W.J. Hunter	
	World Models of Occupational and Environmental Health Systems by: J. Rantanen	

Executive Summary

An invitational workshop attended by scientists from the 3 NAFTA countries and Europe was held in Ottawa in March 1994. It was sponsored by the International Development Research Centre (Canada), the National Institute of Public Health (Mexico) and the Institute of Medicine (USA) to discuss planning of research about environmental and occupational health systems in the NAFTA countries. The aims were to evaluate the system models and the underlying concepts, to agree on a study framework, to consider a strategy focussed on practical research in industry, to set time frames and priorities, to identify researchers and funding sources and to plan administrative steps, including ways of communicating between researchers.

Consensus was reached on the following points:

There were considerable differences between the systems in Canada, Mexico and the U.S.A. The systems, which had evolved for national needs, should be evaluated for gaps and inconsistencies in the light of the new demands due to free trade.

Occupational and environmental health protection systems should be treated as two sides of the same coin wherever possible for research purposes.

A common interest existed in the 3 countries in anticipating threats to the environment and to worker health which might result from free trade.

Europeans had had to deal with similar free trade problems over several decades. There was willingness to exchange information, ideas and experiences.

A balanced international perspective, under the umbrella of the non-political sponsoring agencies without unilateral national dominance, was essential to plan such research and to carry it out in an impartial and balanced manner.

A network of scientists from the participating countries and sources of international expertise should be set up, on an inclusive and open basis. This should include centres of scientific excellence and relevant experience such as the European Union and the Finnish Institute of Occupational Health. A newsletter should be produced which would include matters of interest to managers, workers and the public, give visibility and attract members to the group, and encourage a free flow of information and opinion. Stable research funding should be sought.

Links should be established with the Commissions of Environmental and Labour Cooperation, to ascertain their current areas of research interest, to offer information and to assist them to locate sources of advice and expertise.

A start should be made on a project in a specific industry, such as inspection practices, enforcement traditions and capacity building needs, or information sources in the 3 countries such as those on hazardous waste and its disposal.

PARTICIPANT LIST

WORKSHOP - COOPERATIVE STUDY ON OCCUPATIONAL & ENVIRONMENTAL HEALTH SYSTEMS

March 28-30, 1994 Ottawa, Canada

- | | |
|---|--|
| <p>Dr. Donald C. Cole
Research Fellow
Environmental Health Program
McMaster University
BSB B150
1200 Main Street West
Hamilton, Ontario
L8S 4K1
Tel: 905-525-9140 ext.22338 or ext.27559
Fax: 905-524-2400
Internet: coledon.@fhs.mcmaster.ca</p> | <ul style="list-style-type: none">◆ physician, trained in occupational and community medicine (FRCPC)◆ masters in design, measurement and evaluation of health services (M.Sc.)◆ worked in community health centres doing primary health care and occupational health for over a decade◆ has done research on pesticides in Central and South America◆ recently joined McMaster University as a research fellow in environmental epidemiology/health |
| <p>Dr. Graham W. Gibbs
President
Safety Health Environment International
Consultants Corp.
Box 27, Site 17, R.R.2
Winterburn, Alberta
Canada T0E 2N0
Tel: 403-987-2883
Fax: 403-987-4901</p> | <ul style="list-style-type: none">◆ formally trained in Biological Sciences (M.Sc McGill University) and Epidemiology (Ph.D. McGill U.)◆ more than 30 years of experience in the field of Occupational and Environmental Health and Safety◆ founding Director of the Institute, now Department of Occupational Health, McGill University◆ currently adjunct Professor at the University of Alberta◆ adjunct Associate Professor at the University of Calgary, Alberta.◆ Author/Editor of several books on occupational health issues and more than 100 presentations/ publications in the scientific arena◆ currently a consultant in occupational epidemiology and hygiene◆ active in research and international initiatives, in particular with IPCS and as chairman of the Scientific Committee on Fibres of the International Commission on Occupational Health |
| <p>Mr. J. Roy Hickman
Director General
Environmental Health Directorate
Health Canada
Room 103, Tunney's Pasture
Ottawa, Ontario
Canada K1A 0L2
Tel: 613-954-0291
Fax: 613-952-2206</p> | <ul style="list-style-type: none">◆ Director General, Environmental Health Directorate in Health Canada◆ responsible for the Canadian federal health programs on the impact of pollution on health, radiation protection, tobacco legislation, consumer product safety and the safety and efficacy of medical devices◆ research career involved determining the safety of irradiated food and medical products◆ emigrated from the U.K. in 1967 to join Health Canada to evaluate the safety in-use of pesticides◆ 1971-74 Director, International Project in the field of food irradiation in Karlsruhe, Germany |
| <p>Dr. John Markham
Senior Program Specialist,
Occupational and Environmental Health
Health Sciences Division
International Development Research Centre (IDRC)
250 Albert Street
12th Floor
Ottawa, Ontario
Canada K1G 3H9
Tel: 613-236-6163 ext. 2280
Fax: 613-567-7748
Internet: jmarkham@idrc.ca</p> | <ul style="list-style-type: none">◆ Physician, DPH, DIH◆ FRCPC (Community Medicine)◆ FRCPC (Occupational Medicine)◆ Medical Director/Advisor at various times in mining, municipal health, health care, and small industry◆ Professor, Occupational Health (20 years) Directed and taught graduate course for medical specialists in Occupational Medicine◆ 1986 - present - Chairman, Distance Learning Course, University of Alberta◆ 1993 - present - Senior Program Specialist in Occupational and Environmental Health |

Dr. Jean Yves Savoie
Directeur Général
Institut de recherche en santé et en sécurité du travail
505 boul. Maisonneuve O.
Montreal, Quebec
Canada H3A 3C2
Tel: 514-288-1551
Fax: 514-288-2998

- ◆ PhD chemistry, post doctoral studies immunochemistry
- ◆ head of toxicology laboratories, Quebec Toxicology Center (1973-1980)
- ◆ head of Industrial Hygiene and Safety Laboratories of Institut de recherche en santé et en sécurité du travail du Québec (IRSST) 1980-present
- ◆ Scientific Director of IRSST (1984-1990)
- ◆ Director General of IRSST (1990-present)

Dr. Annalee Yassi
Director - Occupational and Environmental Health Unit
University of Manitoba
5112-750 Bannatyne Avenue
Winnipeg, Manitoba
Canada R3E 0W3
Tel: 204-789-3289
Fax: 204-772-8748

- ◆ MD & DOHS - McMaster University
- ◆ M.Sc. (epidemiology/occupational health) University of Toronto
- ◆ certifiant from Cdn. Board of Occ. Med. & Royal College Fellow in both Community Medicine and Occupational Medicine
- ◆ 14 years as occupational physician for labour, management and government organizations
- ◆ 8 years - university based research and teaching at University of Manitoba
- ◆ Director of Dept. of Occupational & Environmental Medicine, Winnipeg Health Sciences Centre
- ◆ active in health hazard evaluations and environmental impact assessments
- ◆ currently medical consultant in the office of Global and Integrated Environmental Health at WHO and external collaborator for the Encyclopedia of Occupational Safety and Health, ILO

Dr. Jorma Rantanen
Director General
Finnish Institute of Occupational Health
Topeliusenkui
00250 Helsinki
Finland
Tel: 358-0-474-7340
Fax: 358-0-474-7548

- ◆ MD, Specialist in Occupational Health
- ◆ PhD, DRMED SU, Medical Biochemistry
- ◆ Chief of the Dept. of Toxicology 1970-74
- ◆ Director General and Professor of FIOH since 1974

Dr. Alexandre Berlin
Adviser
Health and Safety Directorate
European Commission
Batiment Jean Monnet
B.P. 1907
Luxembourg
Tel: 352-4301-32724
Fax: 352-4301-34511

- ◆ Ph.D Chemistry
- ◆ European Commission 1964-present

Dra. Guadalupe Aguiar
Unidad de Medicina
Familiar /28 Gabriel Mancera
Esq. San Borja
Col. del Valle
Mexico
Tel: 552-547-7256
Fax: 552-547-7256◆

- MD and occupational physician at the Instituto Mexicano del Seguro Social

Dr. Fernando Díaz-Barriga
Coordinator Environmental Toxicology Laboratory
Autonomous University of San Luis Potosi
Av. Venustiano Carranza 2405
3^{er} Piso Av.
78210, San Luis Potosi
San Luis Potosi
MEXICO
Tel: 52-48-130499
Fax: 52-48-176976

- ◆ M.S. in cell biology
- ◆ Ph.D. in cell biology
- ◆ Areas of investigation:
 1. Toxicology of chemical mixtures
 2. Human exposure to heavy metals
 3. Human exposure to hazardous waste

Dr. Mauricio Hernández
Director
Centro de Investigaciones eu Salud Publica
Av. Universidad 655
Cuernavaca, Morelos
Mexico
Tel: 73-175391
Fax: 73-111148

- ◆ MD from the National Autonomous University of Mexico
- ◆ DSc for the Harvard School of Public Health (Epidemiology)

Dr. Luis Hernández Lezama
Coordinador de Asesores Sub Secretaria de Regulacion
Secretaria de Salud
Lleja 7 2° piso
Col. Juaraz
C.P. 06696
Mexico, D.F.
Tel: 52-553-7049
Fax: 52-553-7374

Dr. Howard Frumkin, M.D.
Director, Division of Environmental &
Occupational Health
Emory School of Public Health
1599 Clifton Road
Atlanta, Georgia
30329 USA
Tel: 404-727-3697
Fax: 404-727-8744
Internet: frumkin@sph.emory.edu

- ◆ internist
- ◆ occupational health physician
- ◆ epidemiologist
- ◆ Director of: an academic division of Emory School of Public Health (EOH); Emory's occupational medicine residency; and Emory's Environmental and Occupational Medicine Clinic

Dr. Christopher P. Howson
Director
Board on International Health Institute of Medicine
National Academy of Sciences
2101 Constitution Ave.,N.W.
Washington, D.C.
20418 USA
Tel: 202-334-2348
Fax: 202-334-3861

- ◆ BA Swarthmore College
- ◆ PhD 1983 Epidemiology UCLA, Chronic disease epidemiology, nutrition, immunology, and health services epidemiology
- ◆ 1983-86 Senior Epidemiologist American Health Foundation/Memorial Sloan Kettering Cancer Center, New York
- ◆ 1986-present Institute of Medicine, National Academy of Sciences Research - Interest assessing causality from incomplete or conflicting data; health policy formulation.

Dr. Kathleen M. Rest, Ph.D., MPA
Assistant Professor, Occupational Health
University of Massachusetts Medical Center
Dept. Family & Community Medicine
55 Lake Avenue North
Worcester, MA
01655 USA
Tel: 508-856-6664
Fax: 508-856-1680

- ◆ over 15 years experience in education and training of health professionals in occupational and environmental health (OEH)
- ◆ member, several Institute of Medicine committees on enhancing the role of physicians in OEH
- ◆ founding member, Consortium for Environmental Education in Medicine
- ◆ Past President, Occupational Health and Safety Section of the American Public Health Association (APHA) and present member of APHA Program Development Board
- ◆ areas of research:
 - worker and community right-to-know;
 - workers' compensation;
 - regulation of workplace health and safety

Dr. Anthony Robbins, MD
Professor of Public Health
Boston University
1734 P Street N.W.
Washington, D.C.
20036 USA
Tel: 202-401-8141
Fax: 202-690-5761

- ◆ BA Harvard 1962
- ◆ MD Yale 1966
- ◆ MPA Harvard 1969
- ◆ 1970-72 Assistant Professor Epidemiology McGill;
- ◆ Commissioner of Health, State of Vermont;
- ◆ Health Director, State of Colorado
- ◆ Director, National Institute of Occupational Safety and Health;
- ◆ Staff, Committee on Energy and Commerce, US House of Reps.
- ◆ Presently Professor of Public Health, Boston University, School of Public Health on leave to direct National Vaccine Program Office, DHHS

Dr. Roberto A. Sánchez
Director of the Department of Urban &
Environmental Studies
El Colegio de la Frontera Norte
P.O. Box L
Chula Vista, CA 91912
USA
Tel: 1152-661-33535 or
1152-661-33538
Fax: 11661-33555
Email: robsan@cicese.mx or rsanchez@bestsd.sdsu.edu

- ◆ Director of the Department of Urban and Environmental Issues at El Colegio de la Frontera Norte (COLEF)
- ◆ Professor of Environmental Management
- ◆ During the last years, he has been working on the environmental problems at the US-Mexico border region, including NAFTA potential environmental aspects, the environmental impact of the maquiladora industry, the management of transboundary water resources between Mexico and the US, and the negotiation of environmental problems between Mexico and the US.

Dr. Ellen Silbergeld
Senior Toxicologist (Prof. Epidemiology)
Environmental Defense Fund
(Univ.MD Med.Sch)
1875 Conn Ave. NW
Washington, D.C. 20009
USA
Tel: 202-387-3500
Fax: 202-234-6049
Email: eks@edf.org or
esilbere@umab.umd.edu

- ◆ PhD environment engineering John Hopkins University
- ◆ post doctoral environmental medicine and neuroscience, John Hopkins U.
- ◆ staff scientist, NIH (NINOS, NICHD)
- ◆ adj. prof. John Hopkins School of Hygiene
- ◆ member, US delegations to OECD Chemicals Programme, 1983-present
- ◆ member, US Dept. Energy Sci.Adv.Bd., 1983-1989; 1994-present
- ◆ member, Bd. of Sci. Councillors, US Nat. Tox. Prog., 1986-1993
- ◆ member, NAS Bd. Envir. Sci. & Toxicol., 1983-1989

PROPOSED PLAN FOR COLLABORATIVE ANALYSIS OF THE OCCUPATIONAL AND ENVIRONMENTAL HEALTH SYSTEMS IN MEXICO, U.S.A. AND CANADA

Introduction & Briefing Paper to Workshop Participants

The recent creation of large free trade areas in Europe and between the U.S.A and Canada has stimulated reviews of the worker health and environmental protection arrangements in the countries involved. The free trade negotiation process in the Americas promises to spread beyond Mexico to South America and the Caribbean area subsequently. This has become of interest to IDRC, because healthy development requires that the relevant health protection systems are reasonably equal in effectiveness and preferably harmonized. An opportunity now exists to accomplish this in an upward direction so that an optimal level will, in due course, be provided throughout the trading areas in developing countries without disadvantage to any participating nation. The international nature of trade and the unity of the world environment calls for coordination of the protective efforts in order to protect the region as a whole. In company with other similar organisations in the U.S.A. and Mexico, IDRC plans to promote research into suitable methods of providing occupational and environmental health protection and also promoting worker health in their respective countries.

The Western industrialised nations have many patterns of occupational and environmental health protection which diverge widely in kind. Those in North America have been overtaken by the rapidity of technological change and the growth of international corporations; they are not considered world models in at least some respects, though they have some areas of excellence. There is an opportunity, in the process of upward harmonization, to take a fresh look at the suitability of the existing patterns to meet present and future needs. For example, in Canada, the administration of occupational health, workers' compensation and environmental protection has evolved at the provincial and even territorial level with standards locally set. Occupational health (in the workplaces which generate much of the toxic effluent) is regulated separately from environment. It is timely to consider whether these patterns of administration are suited to the international free trade environment and whether their variability takes away from good compliance and the prevention of ill-health, and creates additional costs for industry.

Documentation of the structures and the assessment of the strengths and weaknesses of the systems available in the early participants (Mexico, U.S.A. and Canada) using international models as yardsticks, would be of help to the ultimate decision makers in planning the future protective systems for the combined free trade area. The political levels of these societies have naturally become accustomed to the traditional patterns of administration in their own countries and will, therefore, tend to perpetuate them unless a clear range of reasonable alternatives can be presented to them.

General Plan of Action

IDRC proposes to work with non-political, scientific collaborators in Mexico such as the National Institute of Public Health, and in the U.S.A. the Institute of Medicine of the National Academy of Sciences. Jointly, the steering group thus formed will identify interested researchers who wish to study the relevant aspects of the occupational and environmental health systems in the three participating countries. It will coordinate the studies and assist in the financing, either directly or by involving other donors.

This is expected to result in the analysis, by 3 coordinated teams or networks, one in each country, of the formal and informal systems, both governmental and non-governmental, which protect or promote the health of the population in their work roles (occupational health) and in their environment outside the workplace (environmental health). The same framework of types of activity which make up the total system will be used for all 3 teams. Scientists from other countries, such as Finland or the European Community, with different national systems and/or experience of their functioning in international trading blocs will be invited to be involved in the early stages of the planning. Representative sectors of industry will be selected for study, to integrate the components of the system. The steering group will also coordinate the synthesis of the information obtained into a form which will be of assistance to the political and other groups who are involved, to the scientific and professional community and to the public.

Any occupational and environmental health protection and promotion system will have two main components which may be described as scientific/professional and political/legal. The term "political" is used in this context to mean the use of power, by legislative, financial and industrial means, based on representation of the interests of the community as a whole or of a particular group in society. Examples are Government, industry and trade unions. These groups and others, such as farmers and environmental groups will, through their representatives, be key in making the decisions which will ultimately select and shape the systems being studied and planned.

However, the proposed comparative study is to be directed to the scientific and professional aspects of providing effective, and hopefully optimal, health protection and promotion with respect to workplaces and environment. This will be available for later consideration by the political and legal entities in the 3 nations. To combine the political decision process would tend to bring the political process into operation before the menu of options is fleshed out. This will not preclude the participation of individuals with scientific, professional, and technical qualifications, and who are presently working in organisations which have vested interests in the perpetuation of present social structures, in a purely personal capacity. They would do so to give the benefit of their expertise, but would not represent the interests of their employing or party organisations.

Initial Phasing

A 3-day workshop will be held in Ottawa at IDRC from March 28th to 30th 1994, involving approximately 20 people, 6 from each country. In addition, international authorities such as Prof. Jorma Rantanen from the Finnish Institute of Occupational Health and Dr. Alexandre Berlin from the European Economic Community will participate. The proceedings will be translated simultaneously in Spanish, French and English, and published.

The purposes are to:

1. Having reviewed the available models, agree on the components of a suitable and adequate occupational health and environmental health system in an international free trade area in a similar level of development to that in North America. If feasible, a time would be estimated for the analysis of each component, in the 3 participating countries, perhaps in phases;
2. Identify funding agencies interested in various components of the system;
3. Identify competent researchers in the 3 countries;
4. Agree on a provisional matrix for parallel study of the existing and potential systems in the 3 countries, drawing on the above review (a draft is appended);
5. Discuss administrative strategies for the conduct of the research.

DRAFT MATRIX FOR COLLABORATIVE STUDY OF OCCUPATIONAL AND ENVIRONMENTAL HEALTH IN CANADA, MEXICO AND THE U.S.A.

1. Components of the System

- A. Overall leadership, scope and prevailing paradigms
Stated national policy? National Institute?
- B. Government Administrative structure -
National/Provincial/State primary responsibility? How coordinated?
Melded or separate environmental and occupational health?
- C. Regulatory agencies
Permissible exposure levels for the working and the general environments and standards for the safety of working conditions Enforcement traditions and their determinants - (Advisory or enforced?)
- D. In-plant occupational and environmental health services -
Scope vs. I.L.O. recommendations? Regulated? Incentives?
Catering for miscellaneous smaller workplaces (less than 500 people)?
Combined with primary health care?.
- E. Workers Compensation/Social Security jurisdiction and roles

2. Infrastructure

- A. Workers' health data system and exposure records
- B. Technical information access and education -
Workers (the "Right to Know")
Managers
Environmental baseline and other information for interested people
Public awareness and education
- C. Education of professionals
e.g. environmental chemists, industrial hygienists, occupational physicians, biologists, ergonomists, administrators, engineers, labour representatives, inspectors, occupational health nurses,
- D. Research : - Occupational Health
- Environmental Health
- E. Industrial Sociology: The roles of Trade Unions and Management - are they always adversarial, or cooperative in some respects? In industry, are scientists and well-qualified health professionals regarded as technicians paid by management to serve their interests, or as respected guides?

3. Example or "Sentinel" Sectors of Economic Activity for Research Purposes

Agriculture
Nuclear Industry
Manufacturing (e.g. automobiles, electronics, ceramics, small Industry)
Mining

Explanatory Notes on the Proposed Study Matrix

In the following notes, a matrix of occupational and environmental health system components is described to assist the development of collaborative research projects to describe and compare the systems between the 3 countries. The workshop members are invited to consider this as a basis for further development, and to select the components with respect to priority in time and importance, and to practicability.

These notes are intended to clarify the intended meaning. Definitions are proposed also for the terms "occupational health" and "environmental health", using these terms to describe an activity by either Governments or by non-governmental agencies. Some questions are suggested for consideration.

Definitions: Occupational Health

Occupational Health was defined by WHO in 1950 as follows: "Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of departures from health caused by their working conditions; the protection among workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological ability and to summarize: the adaptation of work to (wo)man and of each (wo)man to his (her) job".

It is clear from the second and third clauses that this definition includes safety. The addition of the word "safety" coupled with the word "health" has often been used to emphasize the need to prevent unsafe conditions of work and in particular physical injury, even though the word "safety" is redundant. Because this use of the term "safety" has tended to introduce an artificial division into the practice of prevention of ill-health and injury at work, it has been avoided here.

Environmental Health is defined in this context as "The prevention among human populations of departures from health caused by exposure to harmful chemicals or other environmental conditions outside the workplace."

1. Components of the 3 National Systems

A. Overall leadership, scope and prevailing paradigms.

National Institutes

The presence or otherwise of an effective National Institute or of Institutes to provide moral and scientific leadership to unite all the interested elements and scientific disciplines in the cause of worker and environmental health.

The National Policies

The national policies, stated and unstated, concerning occupational and environmental health. The degree of their implementation, either by legislative bodies or by influential non-Governmental organisations such as Universities, learned societies, management organisations or trade unions.

B. Government Administrative Structures

Environmental Health and Occupational Health have for historical reasons evolved separately, but it is timely to question whether the separation is wise in the face of rapidly spreading industrialisation, expanding population and increasing consumption of commodities. Places of production generate the environmental burdens of the future. The decisions taken within places of production determine the consumption of energy and raw materials which go into the process, the effluent from the production process, the effects of the product itself and of its eventual disposal. Knowledge of potential or actual effects on workers is useful to give early warning concerning the effects on the population outside a factory's gates.

The workshop is invited to address such questions as:

Where is the major responsibility for occupational health and for environmental health in each country? Is it at the National or the Provincial/State level for the regulatory agencies? How are they coordinated, and how well does this work?

Should Environmental Health and Occupational Health be united or separate ?

Are they now, or should occupational health and environmental health activities be, unified at the governmental, university/training/ research, and/or "in-plant" levels? Is a co-ordinated but separate approach sufficiently effective and efficient for industry to deal with or ideally so? Where do Workers' Compensation and Social Security fit in with these concepts?

C. Regulatory Agencies

The effective regulation of unsafe working and environmental conditions is a common interest in the three countries which share the North American environment. It will prevent companies avoiding the best regulated areas to operate and thus prevent a levelling down of environmental and safety and health standards to attract business. The intent is to create an atmosphere in which the standards will be harmonized in an upward direction. Uniform health and safety standards will assist business to comply and to do so with minimum costs. The way in which standards are set deserves study.

Enforcement traditions of the standards vary in different societies and even in different industries within the same country. The factors which lead to effective observance of regulated safe levels and conditions require investigation, and ways of monitoring inadequate enforcement practices need to be developed to remedy unsafe conditions and to improve relationships.

Questions:

How are occupational and environmental health standards set?

What are the determinants of effective observation and enforcement of regulatory standards? Does decentralisation like that of Canada into 12 separate provincial/territorial sets of regulatory agencies, plus the Federal Government, each with its own set of regulatory standards, favour good enforcement? Or does decentralised regulation make each area vulnerable under free trade to pressure from industry to relax local standards?

D. In-Plant occupational and environmental health services

Definition: Health services organised in or near a workplace or place of employment that provides appropriate health services to workers, and monitoring of the work environment and the environmental health effects of the operation of the workplace.

The service is designed to:

- Protect workers and the public against any health hazard that may result from their work operations and work environment.
- Contribute to the workers' physical and mental adjustment by adapting the work to the workers and assigning the workers to jobs for which they are suited.
- Contribute to the establishment and maintenance of the highest possible degree of physical and mental well-being of the workers.
- Provide rehabilitation for the workers when necessary.

While many functions can be performed without conflict; the client, whether management, public or worker, will wish to know where the occupational and

environmental health service provider's ultimate loyalty lies in the event of a potential or real conflict. This is especially so where, for example, physicians, nurses and other occupational and environmental health professionals are paid by management (as they usually are), and it is crucial to the attitude of workers and the public to the health professionals and vice versa. The issue may be smudged where the matter is left to the forces of power, money and professional ethics.

Questions;

Is there quality control of occupational and environmental health services within places of employment, as there is in many societies for the "therapeutic" health care system outside workplaces, or is their functioning left to open market forces and ethical codes? Do physicians and nurses (and other health professionals) in occupational and environmental health services within places of employment primarily direct themselves to the short term profitability of health measures and/or to management control of workers on the one hand, or primarily direct themselves to the health of the workers and the public? If there is quality control, are the ILO recommendations the standard used? If quality control, should it be done by regulation or incentives or both? Are services provided at the place of work for farmers and the self-employed?

E. Occupational and Environmental Health Services for Small Industries

The need for occupational and environmental health services for firms of less than 500 people, which employ over 50% of the labour force in most countries, is no less than for larger firms. The reason for the number quoted is that this is about the smallest size for which it is economic to hire skilled people for the single firm. The needs of the individual workers and the environmental impact per worker are likely to be at least as great as the larger firm. However, unless some cooperative arrangement can be made between a group of companies to provide a "critical mass" of 500-5000 workers, no adequate or competent health services, or environmental health advice concerning product environmental impact, are likely to be available. Group services catering for more than one organization are available in many countries.

Experience in Britain has shown that such services, once set up, tend to survive but usually need special funding to start. In that setting, very few start spontaneously. Also, a proper range of preventive services may need some regulation or incentives combined with quality control in the long term, to avoid their being "quick treatment" services.

However in the Scandinavian countries and in France, cooperative group services for small workplaces have been highly successful, often accompanied by union-management agreements or legislated requirement.

Questions:

What measures can be taken to encourage such arrangements?

What proportion of workers are in such organisations?

What proportion are in various hazardous industries?

The ILO Recommendations for Occupational Health Services in Places of Employment(1985) refer to the role of occupational health services as being primarily preventive and related to the healthiness and safety of the workplace conditions and adapting the job to the worker, rather than to general medical care and treatment, except in emergencies or for first-aid. However, this is not always the case in practice. In developed countries, general non-occupationally-related health care, however desirable it may be, tends to divert attention from the preventive activities with which we are concerned.

Questions:

Are Occupational Health Services within places of employment combined with primary health care, and is this desirable in LDCs and developed countries?

F. Workers' Compensation/Social Security Agencies

The mechanisms of compensating workers for injury and occupational illness are frequently combined with preventive roles. There is often a data base associated with the payment of compensation or compensation claims, which may be one of the major sources of information about the types and frequencies of injuries in various industrial sectors which can be used in prevention. However, the ways in which the information is classified, collected, stored and linked need to be suitably designed to provide a statistical basis for preventive efforts. This may be lacking in a system designed for payment purposes. In the Canadian system, there are 12 separate Boards across the country with separate systems, and this poses problems where the labour force is very mobile between different parts of the country. Workers' compensation agencies clearly have an interest in encouraging good preventive health and regulatory agencies for workplaces, and assisting training and research in occupational health and are, therefore, potential sources for funding them.

Questions:

How are workers' compensation/social security organised? Do they fund preventive workplace services, regulatory agencies, professional education or worker health research? How effective are their health data bases in locating health hazards to assist in prevention of ill-health and injury or in the diagnosis of worker health problems?

PROCEEDINGS FROM WORKSHOP ON OCCUPATIONAL AND
ENVIRONMENTAL HEALTH SYSTEMS
March 28-30, 1994
Ottawa, Canada

PLENARY SESSION

INTRODUCTIONS

Dr. John Markham, Senior Program Specialist, Occupational & Environmental Health, International Development Research Centre (IDRC), Canada

Ladies and gentlemen and distinguished colleagues: with me are my fellow members of our workshop steering committee. On my left is Dr. Mauricio Hernández, who is Director of Research and Public Health at the National Institute of Public Health in Cuernavaca, Morelos, Mexico. On my right is Dr. Chris Howson, who is Director of the Board of International Health of the Institute of Medicine (IOM) in the National Academy of Sciences in Washington, USA. We three are collaborators. The study that we hope will be undertaken with the help of many people, and with yourselves playing leading roles, is going to be a collaborative effort. We have to act as facilitators and of course, we shall obviously have to add other people in more specialized fields as we go along.

We have invited Dr. Jorma Rantanen and Dr. Alexandre Berlin as world figures in the field to advise us. Others of you have been invited as leading professionals or academics proposed by your countries' collaborating institution and even though many of us hold high positions in our respective countries, we're not expected to represent the political interests of any power group. We are speaking as ourselves, giving the benefit of our personal wisdom and experience in the collaborative design of a research agenda on occupational and environmental health systems in the three countries to aid in the upward harmonization of the systems. It's at a later stage that the political groups will be decisive, but they will be aided by any success that we may have. This is our view. The steering committee has suggested a number of questions, which we hope at the end of the workshop to have either answered or addressed as to how to proceed. We hope that, having started by evaluating the concepts and system models in occupational and environmental health, we will be able to agree on some kind of common study framework.

We have made some suggestions about the study framework. Professor Rantanen and others will make suggestions. We hope we'll have some common framework so that people can readily coordinate their research plans and compare the one country with the other. We may wish to evaluate the approach of using an industry-focused study, that is, looking at the systems as they work in specific industries such as agriculture or manufacturing or mining, whatever we think is appropriate to make the whole thing practical and not just abstract. But that will be the decision of the group. Then, we also want to try to set some priorities and time frames. An example of this

is capacity building, which is a very important thing, certainly in Canadian society and, I think, probably in Mexico as well and perhaps in the United States. Also, what are the determinants of enforcement, so that we know whether, in fact, our laws are being taken seriously? We wish to try to identify researchers and funding sources. And finally, we must discuss administrative or networking steps so that we can keep up the work and decide how we are going to do it, instead of just going away feeling improved. With that, I'll give the floor to Dr. Mauricio Hernández.

Dr. Mauricio Hernández, Director, National Public Health Institute, Mexico

For Mexico, there is no doubt the changes we are facing are great. Reaching a continental system is, in a way, frightening because of the challenge it entails. What we want to come out of this meeting is a clear research agenda that will facilitate this continental system. We don't hope to reach the continental system tomorrow or even next year, but we need your help to take steps toward gathering information needed for this purpose.

Dr. Christopher P. Howson, Director, Board of International Health, Institute of Medicine, Academy of Medicine, USA

I would like to very quickly describe the nature of the Academy complex because I think this might be helpful in determining the role we might play in any activity stemming from here. Basically, the National Academy of Sciences complex consists of three arms: the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The Institute of Medicine's principal resource for carrying out its mission is a membership of some 500 individuals representing a broad range of expertise in medicine and health. By charter, at least one-quarter of our members come from areas outside the fields of medicine and health, including law, economics, engineering and the physical sciences, a diversity of perspective and expertise that I think brings some utility to our work. We have a number of mechanisms for accomplishing our work, ranging from traditional 18-month studies with an oversight committee, from which a report stems, to shorter-term activities. We also employ fora, which are becoming more common in the academy complex, wherein we bring together a broad range of people, for example, representatives of industry, the private and public sectors and others with interests in that particular activity. Such fora often bring together persons who might not normally meet. I would see that as a possible mechanism for the types of activities that may stem from this meeting.

I also bring you greetings from Bruce Alberts, President of the National Academy of Sciences and Ken Shine, President of the Institute of Medicine, who are extremely pleased with this tripartite activity. This fits within a growing portfolio of activities and cooperative studies between Mexico and the US, which have as their goal the

systematic review of transfers of health risks and benefits as economic, social and cultural integration of Mexico and the US accelerate, as a result of the North American Free Trade Association (NAFTA).

Within the IOM, these burgeoning activities have been driven by an active and productive collaboration with the National Academy of Medicine in Mexico. Examples of some of the specific activities we'll be undertaking together over the next few months include: symposium workshops to examine the implications of trade liberalization on the nature and provision of health services in our two countries and, as a very real consequence, on the health of the population; and development of a series of activities that will focus on Mexico/US border regions with respect to lessons of national and binational significance that may help to improve and protect the health of our two countries. We also have activities that extend beyond the US and Mexico to include Canada and other countries of the hemisphere. I bring these up because I think that whatever activities may stem from these three days of discussions will fit together very nicely and we can build on those activities.

Finally, I would, for the record, like to cite a couple of recent IOM activities in which we have had the good luck to be associated with IDRC. These include an international forum of AIDS research and a study on female morbidity in sub-Saharan Africa. The role of IDRC in these activities was of particular interest to me, as IDRC was one of the very few members in both of these to stress the need for bottoms-up evaluation. We had, generally, groups of organizations that tended to say: well, this is what we think would be best under the circumstances. IDRC was always adamant in saying: let's talk to the people at the grassroots level who are implementing the change and doing the work, because they can best inform us about what will work and what might not work. I was struck by the pragmatism and wisdom of IDRC in both these studies and I see the same attitude represented in the way it has approached the materials for this meeting. I just want to say that the Institute of Medicine and the Academy stand ready to help in any way they can with whatever may come from the next few days.

WELCOME TO THE DELEGATES

Dr. Gilles Forget, Director of the Health, Society and Environment Program, IDRC, Canada

By its support to many groups of researchers in Latin America, the International Development Research Centre has a good reputation in the field of occupational and environmental health. We financially support many groups to help them in their efforts to understand factors determining the health of workers, as well as that of their relatives and communities.

Among the Mexican Delegation, I noticed with great pleasure the presence of our friend, Fernando Díaz-Barriga, of San Luis Potosí, principal researcher of a project financed by IDRC several years ago, dealing with arsenic and cadmium contamination. IDRC is also financing a small postgraduate student scholarship Master's program in Occupational Health in eight Latin American countries, in which the Autonomous University of Hochimilco, Mexico is also taking part.

Mexico enjoys a great prestige throughout the Americas and occupies a leading position in matters of economic development, which is recognized by other Latin countries. For this reason, its participation in this initiative will signify the beginning of a much broader process.

To simplify our work, we shall have the opportunity to listen to Dr. Jorma Rantanen, of Finland, and Dr. Alexandre Berlin, of the European Commission. Dr. Berlin has more than 30 years' working experience with the European Community (EC). During that time, he applied his harmonization efforts among the countries of the EC, and I believe that his experience will help us a great deal in our discussions. Dr. Berlin will speak about his experiences later.

IDRC is active in the promotion of occupational health systems in developing countries, which is seen as a key response to the threats to health posed by the working environment. There is now a feeling in Canada that there exists an intense free trade atmosphere in Latin America and in the Caribbean.

Why is IDRC interested in being involved in a research initiative on the harmonization of systems and principles for professional and environmental health? We have always been aware of the important role that the environment plays with regard to sustainable and equitable development. In 1986, IDRC established a Health and Environment Program. The objectives were to fund holistic research on the relationship between the health risks posed by the environment and human behaviour. Professional health has always been an important component of the Program's activities. In the period since the Rio de Janeiro Earth Summit, the Program has become a key element of IDRC's strategy for moving forward on the recommendations of Agenda 21.

Furthermore, we have recently heard Mr. Clinton, President of the United States, say that the time is right for similar free trade agreements with the Pacific Rim countries. The real question now is how to adapt to the realities of a free trade agreement environment without a return to the health problems of the industrial revolution. This is the kind of research effort that IDRC is hoping to foster through this initiative, which has brought you all together here this week. We believe that NAFTA is only a first step in the globalization of trade. We consider that the findings arising from such an initiative between Canada, Mexico and the United States will have far-reaching implications for the developing countries of the world, which are at the center of IDRC's mission.

I would like to turn now to the pleasant task of presenting the first speaker, my good friend and colleague Dr. Jorma Rantanen, who is Director General of the Finnish Institute of Occupational Health. Dr. Rantanen has kindly agreed to attend this meeting and share some of his own experiences in the Nordic countries on harmonization attempts for occupational and environmental health systems. Finland has a very good occupational health system, one that could serve as a model to many countries. So much so, in fact, that Dr. Rantanen's Institute has been involved for many years with the development of occupational health programs in African and, now, Asian countries as an implementing partner for Finland's Aid Agency, the Finnish Department of International Cooperation (FINNDA). In fact, this is how we first met. I had just recently started here at IDRC and was developing projects in Kenya with the factories inspectorate, where the Finnish Institute was already implementing a training program. I am very grateful for the assistance both I and the Kenyan project teams received from Dr. Rantanen's and his colleagues in these project activities. Over the years, we continued to develop joint initiatives and the working relationship between our two institutions has always been excellent. Dr. Rantanen's presence among us today is one more proof of his willingness to help further the cause of occupational health wherever his experience can be a determinant.

WORLD MODELS OF OCCUPATIONAL AND ENVIRONMENTAL HEALTH SYSTEMS

Prof. Jorma Rantanen, Director General, Finnish Institute of Occupational Health, Finland

I have the enormous task of trying to analyze world models in occupational health and safety. I feel very inadequate to do this, but I am going to try to analyze the global trends in working life in general and what kinds of challenges these trends are causing in occupational health and safety and in environmental health. Finally, I will try to propose some models, which we have used and from which we have learned a little bit, both in industrialized countries and also in developing countries.

Let's look at the global trends in working life, which are, of course, difficult to analyze in these turbulent times when everything is changing so quickly; old structures are disappearing, new economic structures forming and many other societal systems are changing very rapidly. What is certain is that internationalization in working life is to happen very quickly. NAFTA is one example of these internationalization programs. In fact, we are approaching the situation of a global village, which is no longer divided into so many parts. We are simultaneously integrating and, in Europe, for example, we are also speaking about the subsidiarity principle, which is the principle of doing everything possible at as local a level as possible. Technology is developing very quickly. One of the technical developments is enormous chemicalization of the world. In fact, chemical production is growing faster than the world population, so that consumption per capita is increasing steadily. We are facing some new biological

hazards like AIDS and drug-resistant TB, which is a new/old hazard for us. We have enormous changes in economic structures as a result of that economic and political integration and we have major demographic changes in the world.

The labour force amounts, today, to about 2.4 billion people, 25 per cent of whom are working in the industrialized world and 75 per cent in the developing world. The productivity of their work input is very unevenly distributed. The working population is growing rather rapidly so that, between the years 1990 and 2000, we will have 16.5 per cent growth in the working population of the world. The growth areas are the undeveloped countries in Asia, Africa and Latin America. The others grow very little. This means we are going to face the problems of a young labour force surplus in those three developing areas and just the opposite is going to happen in the industrialized world. We are going to meet problems of an aging workforce in our industrialized countries. If you look at the economic growth, you see that the most active growth area will be Asia and probably the newly industrialized countries (NIC) in Southeast Asia. The Organization of Economic Cooperation and Development (OECD) is also growing. Urban communities are expected to grow at about a rate of 2.5 per cent per annum at the second half of this decade. As you see, the growth figures in Asia are really going to be remarkable. Among the Asian countries, China will be unique. The growth in China is enormous when you have to multiply the growth rates with enormous population figures.

The strongest economies are situated in the northern hemisphere, so that we are going to face the phenomenon of a tripartite economic world. The three leading centres will be the uniting Europe, southeast Asia under the leadership of Japan, and North America with a NAFTA population base. These are the three points where major development of economies are going to happen in the next decades. Europe is growing very rapidly. Europe seems to be now in the most rapid development when measured by growth or Gross National Product (GNP). In fact, this is not all absolute growth, but it is also the joining of new members to Europe, which is a kind of artificial growth. The long-term trend is very growth-dominated. This means that economies are mainly developing in the corners of a triangle. Unfortunately, the southern part of the world seems not to have too much to say. We have some positive developments in, for instance, Southeast Asia. Africa, on the other hand, seems to decline, rather than grow. It will be interesting to see what will happen in South America. NAFTA may have a very positive impact on South America too, which would be very important because, as I said, the young labour force is seeking jobs in just those southern parts of the world, while economic growth is taking place largely in the northern part of the world. This is not a very good balance.

As for occupational health and safety issues, we are facing two kinds of problems. First, we have those traditional problems of labour accidents, pesticide poisonings, occupational diseases and heavy physical work. We are facing those problems not only in developing and NIC countries, but also in highly industrialized countries. These traditional problems are gaining more and more prominence in countries where

industrialization is rapid and, very often, poorly regulated and controlled. Fully industrialized countries, in contrast, are starting to learn to control the adverse side of industrialization.

In the old industrialized countries, we are going to face those modern problems of occupational health: aging of the workforce, long-term effects of low-level exposures to chemicals and to physical agents such as extremely low-frequency electromagnetic fields, and growing rates of hypersensitivity, causing an increased risk of allergies. Aging of the populations will mean that musculo-skeletal disorders are going to be very important occupational problems. And most of all, as blue collar jobs are transferred to white collar types of jobs, we are going to face many psychological problems.

With respect to aging of populations, we will see increases of epidemic proportions. The quantitative side of aging takes place in developing countries because of the high population numbers. Africa and Latin America are aging at the quickest rate. While aging of the workforce will be the problem of both developing and developed countries, there is a relatively large labour force in the industrialized countries, so that this problem will be met in practice there much sooner than in developing countries.

In Finland, the blue wave group is dominating very strongly the whole age structure of our workforce. Our average age is already over 40. All industries are facing this same problem. There are certain problems with aging. First, the capacity for physical work declines with age. Sport medicine researchers claim that maximum oxygen outtake is decreased by 1 per cent per year, or 10 per cent in ten years. We have found in our studies that the physical worker can manage relatively well up to the age of about 50. But after that — and women seem to decline earlier — we are going to meet the situation where the job demands might be higher than the actual physical capacity of the aging individual. This is going to be a very important problem for industrialized countries: how to reconcile this conflict between physical job demands and the actual working capacity. After 50 years of age, we have found, for instance, among municipal workers, a very rapid drop in working capacity, causing early work disability and retirement.

Development of our mental capacities is not much more positive. In the physical field we can train workers and increase physical working capacity and we have done it, but the mental capacity is more difficult to train back. Our intelligence changes with aging. Crystallized intelligence, which is that type of intelligence we use by taking advantage of our experience, by learning from our mistakes, grows with age. In contrast, so-called *liquid intelligence* --for example, learning automatically to remember phone numbers -- declines rather quickly after 50 years of age. Gradually, we are looking in the occupational health field not only at prevention of well established and well defined occupational and safety hazards, but at rehabilitation and maintenance of working capacity, and at health promotion. This will broaden the scope of occupational health.

We are also concerned with the introduction of new technologies. In the Finnish situation, among our female workers, almost 90 per cent of administrative office and banking workers are using computerized facilities. Aging workers have difficulty learning the new systems, and the systems are constantly changing. This has its consequences for worker attitudes. Between 1977 and 1990, Finnish workers found that their mental workload increased substantially. High-level white collar workers were happy because they had more freedom and more decision-making power with these technological changes. But the poor girls who were doing the real job at the floor level felt that their work had become more binding and more stressful. Work is also changing in the sense that we no longer work with our pen and our hand and with our simple intellectual or mental capacity. Technology is forcing us to work without personality. So we need two different parts of intelligence. We need those memory skills, which are substantial and critical for learning and organizing the daily work and we need our skills to work with new technologies. What has been learned from research on errors, on success, on effectiveness, on quality is that the psychological work environment must be in many respects different from those of old-fashioned working organizations we had in the assembly type of industries or offices.

Because of democratic change in the world and its rapid technological advancements, which are making work more effective, because economic integration is increasing competition and because economies are more turbulent, we are going to face enormous problems of unemployment. There are now probably some 820 million unemployed in the world, constituting one-third of the world workforce. Whereas, earlier, the unemployed were poorly educated, unskilled people and people in the developing countries, now we have directors and managers, highly educated researchers and experts under the risk of unemployment. This has been, at least in Europe, a very big problem for occupational health. We have studied the health consequences of unemployment and have found that the first consequence is enormous frustration. Women are more frustrated than men. However, it is interesting to know that female workers will manage the crisis of unemployment much better than male. At greatest risk is the middle-aged man with low education. Females are able to use their social networks very effectively and have a much greater tendency and capacity to counteract the negative cycle of unemployment. For instance, women don't isolate themselves. They don't become passive. They find something else to do, and that's extremely important to prevent risk behaviour. Women can also maintain social networks much better than men. How to maintain the working capacity of the unemployed is a big challenge for us.

If you look at the detailed risk factors, of course one of the dynamics in occupational health is the labour accident. We are estimating about 100 million labour accidents and 180 thousand fatalities. The figures are going to grow with the pace of industrialization in the developing countries. In industrialized countries, the accident rates have been declining for a long time. There are some countries that are in the process of rapid industrialization and immediately you see increasing risks, as in Portugal. But the Nordic countries and old European countries are showing very stable declining trends. So this tells us that we have been able to control the accident risk

in the industrialized world. But just the opposite is the case in developing countries, where industry is new. There, the risk of industrial fatality is about 10 times higher. The high risk in developing countries is really very simple. If, for instance, a Tanzanian construction worker falls, he will, with more than 90 per cent certainty, die. Construction in developing countries is an extremely risky industry. It is risky in industrialized countries like Finland but more so in Kenya and Thailand, where the construction fatality risk is about 40-fold the risk of Sweden's construction worker.

If you look at occupational diseases, the situation is much more unclear because the concept and definition of occupational diseases is so variable. Occupational diseases are caused mainly by chemical or physical factors. In Finland, the most evident hazard causing occupational diseases and morbidity is epoxy resins, which are a rather new type of risk compared to those in other industrialized and newly industrialized countries. In developing countries it's pesticide poisonings. In industrialized countries, we face new types of occupational morbidity strongly dominated by two important things: allergies and musculo- skeletal disorders.

For distribution of risk in occupational diseases, there is an even more unequal distribution than in the case of occupational accidents. For instance, in Finland there is a 34-fold difference in the risk of a later accident between the lowest-risk occupation and highest-risk occupation. But in the case of occupational diseases, the risk difference is 40-fold. So it really is important what kind of job you do when you choose your occupation. In all industrialized countries we have dichotomic trends, so that some risks are declining, while allergies and hypersensitivity diseases have increased. There is one exception, which is a new/old one. It is asbestos cancer. In Finland, our consumption peak was in the 1960s and '70s and now we register steeply growing numbers of cancers related to asbestos, not only mesothelioma, but also lung cancers. So it is the new/old epidemic that is coming now to our statistics.

Physical workload is an important problem in tropical areas, where the heat stress is always added to heavy physical work. There are four types of heavy physical workload and they have consequences for cardiorespiratory systems and musculo-skeletal systems. The economic conditions in developing countries are still very adverse. The Kenyan welder, for instance, has to weld with one hand and keep the shield on the other hand. He sits the whole day in a very unfavourable position. This is not a unique picture, as those who have visited Africa know very well. But it is not only the problem of developing countries. For those taking care of our aging populations, the back is under a very heavy load. We have measured the pressures between the vertebrae and you would be surprised what kind of stress the back is taking in lifting the old patient. In the case of a person packing luggage onto a DC9 plane, he/she moves five thousands kilos of luggage per day in a space 90 centimetres high. The worker must sit or lie on a trolley, which cannot be made a little bit higher because it is technically impossible. So this is a heavy modern occupation, which is still surprisingly primitive. In developing countries, for instance Uganda, workers are carrying six tons of coffee per day under heat stress. The pathways are not very good and you can imagine the accident risk and the back overload.

In fact, we have done studies with very big material in Finland, covering 7000 workers, and we can measure the positive dose response relationship between the physical workload and the injuries to all parts of musculo-skeletal systems.

So the question arises: how to control, how to manage this situation, which is still problematic not only in developing, but also in industrialized countries. The quality and type of the risk might be a little bit different but it is still there and requires control and regulation. We have a well proven strategy: regulation, enforcement, inspection, information, education, advice services and self-control. In European countries, five different principles are found in legislation and regulations: the protection and prevention principle, the adjustment of work principle, the health promotion principle, the corrective and rehabilitation principle, and the primary health care service principle, which is mainly applied in the case of occupational health services. We have developed some strategies to implement these principles in practice. At the end of the presentation I am going to propose a new strategy, which we have found in Finland to be the most effective. This is the so-called *two-corner strategy*, which looks at the work environment and at the worker and tries to make conclusions and draw relationships between work and health.

Before we go to the new strategies, we should look at the present situation and present models. Who should be in charge of occupational health activities? In Europe, we recently had 32 countries; now the number is 50. We had, in 13 countries, occupational health services under the jurisdiction of the Ministry of Labour and in 17 countries under the Ministry of Health. Of course, the occupational safety side has been under the Ministry of Labour. We have legislation in 26 countries, out of these original 32, concerning occupational health services, 6 countries still have voluntary systems. What is very clear is that legislation is needed. You cannot have occupational health and safety dependent on the morals or conscience of the employers. It doesn't work. So I think all these countries that didn't have legislation at that time were planning measures to try to strengthen the regulatory capacity. Probably the United Kingdom is a little bit different. They are so enthusiastic with deregulation so far. Let's see after the next election!

If you look at the basic orientation of occupational health, the Ministry in charge of the activity will determine the orientation. If the Ministry of Labour is responsible, it is preventive in essence, as in France, where curative (i.e., correction and treatment) activities are not even permitted. In some Nordic countries, preventive and limited curative activity exist. In Eastern European countries, there is a broad scope of comprehensive occupational health service systems, but we have found, in more detailed analysis, that it was mainly the conventional primary health care system brought to the workplace. In Europe, we have about 100 million workers still without occupational health service. However, existing coverage of workers in occupational health services in Europe is absolutely the highest in the world, thanks to our specific legislation on occupational health services of the late 1980s. Even the self-employed are included. If we take the whole employee population of engaged workers, the coverage is more than 90 per cent.

So this kind of system is possible. The system is based on stipulating the obligations of both employers and workers, contents and activities of the services, organizational models, workplace democracy, joint regulation activities, and personnel resources needed. One secret behind high coverage in Finland is government subsidization of the organization and costs of occupational health services by up to 50 per cent and that has expanded the coverage to small industries and to the self-employed. Netherlands has a slightly different legislation, but, again, it is one of the most developed countries in Europe in occupational health services and I cannot but conclude that it is thanks to strong, effective and modern legislation. In Finland, we have stipulated in legislation the activities and functions of services. What is typical in both Dutch and Finnish legislation is that the preventative activities are obligatory, but the curative activities are voluntary.

A new aspect of occupational health services relates to the aging of our workforce. At one time, the emphasis was on prevention. But we have found older workers suffering from chronic diseases, which are affecting their working capacity. We try to control this phenomenon by rehabilitation activities. But we have found it is absolutely too late. We simply are very ineffective in our enormous systems for rehabilitation. We have to put the accent much earlier on the development of working capacity. That's the new element in Finnish occupational health services legislation. We obligate the employer to undertake actions at a very early stage when the work capacity problems or health problems of workers are occurring, and it doesn't matter whether they are occupationally-related or non- occupationally-related health problems. We have a new tiny paragraph in our legislation requesting early actions in view of working capacity.

What is also very important for getting high coverage of services is to use more than one service provision model. The classical model is the big enterprise, big industry, in-plant model. We have, in Finland, made use of four models: a primary health care model, an in-plant model, a group service model and a private physician health centre model. We have tried to evaluate those models, their merits and weaknesses and we have quite a good picture and understanding of which model is fitting which kind of purpose and context.

In developing countries, where the distances are long and the infrastructures are not very well developed, we have tried to introduce mobile units, which are also used in Finland, France, Netherlands and Sweden. One of these is a 27-metre-long clinic operating in mining communities and doing occupational health services, risk service and so on. It has shown its effectiveness in providing services in remote and sparsely populated areas.

In the field of occupational health services, the situation is relatively clear. We have well established infrastructures, and we have a relatively clear proviso of activities and content. In contrast, the case of environmental health is much more diffused. Still, the need is enormous. We have up to one billion people in the world without proper environmental health services and most of the health investments are *post hoc* curative investments and not preventive, predictive types of investments. The World

Health Organization (WHO) analyzed 36 countries at different stages of development but all were undergoing rapid industrialization. Twenty-six out of these 36 had only a minimal level of legislation concerning environmental health. They were, practically speaking, not regulated at all. We have some guidance from international organizations with respect to how to develop environmental health services, but it is, unfortunately, not very clear, as in the case of ILO Conventions on occupational health services.

We are still trying to find the best organizational models. Usually we have in most countries quite a good resource. We have some training on environmental health in universities and so on. But the real service is either old-fashioned sanitary inspection or modern preventative comprehensive environmental health. Looking at all the possible compartments, environment is still missing in most countries. I think it might be missing in the two developed North American countries. It is missing in Finland.

We have several models for organizing environmental health services. We have a public health service model, which is the traditional one, to look at water hygiene, latrines, et cetera. Some countries having to adopt this old public health model to primary health care units encounter certain difficulties. Some of these have been on the competence side. Then we have the instances where Ministries have tried to take over the environmental health services and issues with certain successes and certain weaknesses. Usually the problem is that they don't have enough contact with the health service systems. For instance, the Minister of Transportation may look at the environmental health impact of transportation — exhausts, for instance. The Energy Ministry looks at energy production risks, and so on. This is probably the most expensive but most ineffective model.

Another question was how we could combine occupational health and environmental health services. In Europe we have the European Charter on Environmental Health, which almost 32 countries accepted in 1989. This June, 100 ministers of environment and health will meet in Helsinki in order to accept an action plan for environmental health. The main issue in this action plan is to combine the efforts and competence of environmental health on both sides — health ministerial and environment ministerial — in order to make real impact.

Research is very important for both occupational and environmental health and we have many arguments. We have plenty of arguments to defend that research should be part of all programs. Research activities are very unevenly distributed in the world. Ninety per cent of research experts and 95 per cent of research and development (R&D) budgets are used in industrialized countries, while, particularly in occupational and environmental health fields, the need is just the opposite in developing countries. In carrying out research in a place such as Africa, we first try to find the problems of the country and for that we have made risk surveys. The Finnish Institute is operating in 21 African countries and 20 Asian countries. A very early study that we did in Kenya sought to identify the priorities in the working environment. Workers are being exposed to chemicals.

Personal protectors, which used to be the only preventative tool available, are not available for them when they need them. We have now made about 20 such surveys in Eastern Africa and they have been very good and profitable.

We are doing them also in industrialized countries, such as Sweden. As you remember, occupational diseases were growing very quickly in Sweden because of musculo-skeletal disorders. The national statistics and physician judgements fit very well together. We have surveyed, in Finland, the whole working population. We have some ideas of our exposures. If you were to ask me where the solvent-exposed workers are in Finland, I think I could tell you what are the solvents, how many workers are exposed and roughly what the levels are.

One question is whether occupational health and environmental health approaches should be bound together. In most instances, the source of the environmental pollutant is in the working environment. The difference between the general environment and the working environment is that exposure levels are about 1–3 orders of magnitude higher than they are in the general environment. If you can't control the hazards as close to the source as possible, your exposed groups expand exponentially, costs of control increase and technical and preventive efficiencies decrease. The only thing that happens is probably the dilution of exposure to the lower level. So, we have reason to think about the combination of these two strategies. This is the area in which we should use our creativeness, to make more effective strategies. On the basis of that discussion, I have tried to design a new type of strategy for occupational and environment health. As we have learned in the occupational health setting, we cannot manage by dealing only with worker health. We have to look also at the exposures in the working environment, at prevention, access, managerial systems, company strategies, working organizations, and so on. The same philosophy applies to environmental health on a wider scale. We cannot manage only by looking at the health of the population and possible environmental health impacts. We have to look at the exposure side in the environments and we have to look at what communities are doing to prevent that control. I think that, if Nordic countries have any merit, it might be that to some extent this kind of strategy has been applied and probably has been successful. We are very far from full implementation but I think it's a good strategy.

Finally, can we afford to carry out occupational health and safety programs and environmental health programs? We have had International Labour Organization (ILO) experts analyze the situation. What do effective occupational health and safety programs do for a national economy? What are the burdens and what are the benefits? Countries like Japan, Norway and USA have low fatality rates. They are also known to be the most effective investors in occupational health and safety. They have the highest gross national product per capita in the world. We see other countries that have not put so great an investment in occupational health and safety. They have high fatality rates, high infant mortality rates, and they have the lowest GNP per capita in the world. Now, we can conclude at least two things from this single correlation. First, ambitious and extensive investments in occupational health and safety have not killed economies and, second, you do not derive benefits in

economic factors by compromising occupational health and safety. The same can be said with respect to environmental health. When we are discussing social development and sustainable development we have to keep in mind other development factors, such as high-quality working life. If we don't, we will lose the chances for sustainable development. We have, at present, enormous international economic competition as a part of that integration process. We are under the risk that social dumping will be one of the weapons in this competition.

Therefore, my proposal is this: let's not try to compete by social dumping. Let's agree to at least a minimal level of safety and healthiness that cannot be compromised. And that level is the point at which human rights, basic rights, are offended or saved. And then let's try to protect this kind of international standard. Let's try to find the real competition factors, which are high quality, high productivity and smoothly working production life.

DISCUSSION

Dr. Mauricio Hernández, Mexico

Before going any further, I wish to refer to Prof. Rantanen's talk, from which we have learned a great deal. I should like to return to the recommendation that there be more legislation and more enforcement, which we might call unique, otherwise it would imply leaving the companies to regulate themselves.

This, for example, in the case of Mexico, has great implications with regard to development of human resources to apply to enforcement, because in Spanish there is no word with such an exact meaning. However, taking the first step toward controlling industry, which owns the economic resources of Mexico, in all likelihood the control of technical resources will create a very important policy dualism. I would like you to explain in greater detail how you arrived at the conclusion that it is better to legislate and apply enforcement than to leave industry to somehow regulate itself.

I believe that some thought ought to be given to universal standards; however, local factors must be taken into account, not only malnutrition, but habits as simple as boiling water; this is something very common in our countries. In Mexico, more than 50 per cent of the population boils water for its own consumption, and more than 90 per cent boils it to cook foods. In a study that we have just completed, we demonstrated that the mere act of boiling water increased the risk of dental fluorosis threefold. Therefore, even in these cases, universal standards could affect the developing countries. The other point I should like to mention is that, if we establish parity between occupational health and environmental health systems, despite the objections made here, which I recognized, for Mexico and for many other developing countries, these systems have, in practice, achieved parity. Those of us who study environmental health are also responsible for the few studies undertaken in occupational health. Therefore, even though different standards are employed, we

are the same people and many of us have not received any formal training. In my opinion, we should think about these practical things that are taking place in the world today.

Question

I have a question and this is related to Prof. Rantanen's conclusion, at the same time taking into consideration that in NAFTA we have three countries with different levels of development, particularly between Mexico and the US, and that economic growth, GNP, and protection of either environmental health or occupational health do not have a direct correlation. It doesn't really mean that, if you have economic growth, it will be translated into a higher protection of the environment or better occupational health, particularly in developing countries. In your experience with developing countries, how far do you take into account in these studies the social conditions? I notice that in one of your charts you talk about sanitary conditions. But what about food implementation and other important issues and how does that affect the standards in terms of the strain or weakening of the subject of study that could be occupational or environmental?

Prof. Jorma Rantanen, Finland

If I understand correctly, you are asking whether there should be a double standard between developing countries and less developed countries. I am reluctant to make too much adjustment to standards in relation to socio-economic conditions because the human biology responds similarly, regardless of whether it is a developing country with chronic infections, poor nutrition or chemical exposures. I think we should define a universal minimum standard that cannot be compromised. If the more advanced countries can do better, why not let them?

Question

In the study you did in Africa and Asia, did you take into account that low nourishment has another impact on occupational and environmental problems? How did you incorporate that into your study?

Prof. Jorma Rantanen, Finland

Yes we did. For instance, in many African countries, a man might not only have lead or pesticide exposure, but also five to six other diseases caused by chronic parasitic or bacterial infections, as well as poor nutrition. So we have to take this into consideration. But I think it cannot affect our setting of the minimum standard level. We have to deal with the problem through other means. From this point of view, we are in fact now looking at what populations were used for assessing, from a biological point of view, the dose response relationships. Most of the time the studies have used young middle-aged male adults in healthy developed countries. If the data had been derived from aging populations or from poor health or poor nutrition conditions, would the standards have been different? Would they have been more severe? It's

not so much a question of what the standards should be in relation to the biological data, but whether the epidemiological data on which they were based assessed the least sensitive population.

Dr. Guadalupe Aguilar, Society of Medicine, Mexico

In my opinion, with regard to harmonization of standards in the developing countries, it seems to me that, unlike other countries throughout Latin America, Mexico has standards that have not emerged as a result of the experience of researchers or from the experience of epidemiological monitoring work among the workers; in many instances they are a faithful copy of North American standards or those of other countries, and this does not resolve the problem of epidemiological or occupational health monitoring. It is in monitoring compliance with standards that the problem arises. Officially, we have standards, but, in reality, they are not being monitored. Consequently, we do not resolve the occupational health problem or its prevention.

The other aspect, when standards and international norms are faithfully copied, is that we are face-to-face with problems; they may be ethnic, cultural, problems of individual susceptibility, or problems of magnitude of exposure. There are also problems with the standards, in the sense that workers are not exposed to a single agent, but to a mixture of agents.

There is great labour mobility and this means that workers may be employed by a given company for a certain time, during which they may be exposed to chemical, mutagenic, teratogenic and carcinogenic substances. During another five years, they may be exposed to other types of agents. If this mixture of agents is not taken into account to establish the standard, the problem will persist.

From your own viewpoint, I should like you to tell us how to resolve this problem, or how you have seen this problem being solved in developing countries. That is to say, those who have standards must monitor compliance, and for those who do not have them, how have they undertaken this process of epidemiological monitoring and follow-up of worker health?

Dr. Mauricio Hernández, Mexico

I am interested in what you have mentioned about priorities, and since we are looking for research topics, I should like to ask you whether you believe that there is, at the present time, sufficient information to decide what the priorities are — whether they are incentives, regulations, or information. That is a topic that, as a group, we must consider as a problem to be investigated in the different countries, as we are in different stages in our environmental and occupational systems.

Prof. Jorma Rantanen, Finland

I can only answer by telling what we are doing, for instance, in the Finnish Institute. We have really prioritized. We follow parameters, but before using these parameters, we require a certain level of information. First, we look at the volume of the problem. How many workers are exposed or how big a part of the population is concerned? Second, we look at the intensity of the problem. Is it killing you or only making you a little bit nervous? That's another parameter you have to assess. Then we look at the time trends: whether the problem is growing or declining. We know many problems that are taken care of by time. For instance, structural changes in the working life. If the problem is growing, like aging worker problems, you have to give it high priority because of the time frame. Then, of course, you have to look at whether you have the technology to solve the problem or not. Most of the problems are solvable. Insufficient scientific knowledge is usually an excuse for not doing anything. Of course, we have to take the costs into consideration. What we have, for instance, in the Finnish small-scale industries, is the high occurrence, in up to 60 or 70 per cent of workers, of exposure to noise or hazardous chemicals. But we found that more than 80 per cent of those problems can be removed by one type of action. By using prioritization criteria, you can find targets for prevention. I think the developing countries are full of problems that can be practically removed by one single but competent team with one time action.

American Delegation

I have a question relating to setting standards. As you probably know, in the US there has been a lot of debate about the wisdom of quantitative risk assessment as the basis for public policy or for standard-setting. I wonder if there is a similar discussion in Europe and in Scandinavia and if there is any discussion of alternative models, for example, an examination of technology options or technology-based standards.

Prof. Jorma Rantanen, Finland

I think we have to recognize that we are living in very different types of societies. Nordic countries are so called *consensus societies*, which means that decisions can be made pretty easily on risk control and production if the consensus is achieved between governments, employers and trade unions. Usually it is achieved. The US has an adversarial type of society, where everything should be proven in court before you can make an action. That sometimes is very good. I have seen risk assessment research flourishing in that kind of environment. The time for setting standards is much longer. I wouldn't like to put them into any priority order, but sometimes if you are thinking about the future NAFTA models, probably a consensus type of approach would be better than a strictly and emphatically adversarial one, which is the tradition in some European countries too, Great Britain for example.

**NATIONAL OCCUPATIONAL AND ENVIRONMENTAL
HEALTH SYSTEMS**

THE CANADIAN SYSTEM

**Mr. J. Roy Hickman, Director General, Environmental Health
Directorate, Health Canada**

I was very interested this morning in the discussion because, in Canada, we have organized ourselves differently from any other country that I know, in the sense that our institutional arrangements very much revolve around questions of risk assessment and risk management, at least at the federal level. But before I get into that, just by way of setting the scene, we do have 13 governments in Canada, which are involved in the regulation of environmental and occupational health — one federal government, 10 provinces and two territories. A lot of the municipalities also have a key role in terms of the regulation of both occupational and environmental health. So we have a complex situation.

I would like to touch on the federal/provincial split, which is determined by our constitution. Our constitution was developed as an act of the British Parliament when Canada became a country in 1867. At that time, no one thought about environment very much, and nobody thought very much about health. So there is not a very clear distinction in our constitution about which levels of government have responsibility for occupational health and environmental health. But much of that has developed over the years. For example, in a treaty between King George IV of England and the Mohawk nation, one of the provisions was that the King provide the community medicine chest. And from that has developed the federal government's responsibility to provide health care services to native aboriginal populations. Also determined by the constitution is that the federal government has responsibility for providing health care services to native aboriginal populations. The federal government also has constitutional responsibility for such things as shipping, fisheries, inter-provincial trade and commerce, and for the criminal law of the land. Provincial powers relate to all matters of a local nature: property and civil rights, and ownership of most natural resources. Both of those you will see very quickly relate both to environment and occupational health. In addition, the federal government has the residual powers to make laws for the purposes of peace, order and good government of the country. And some of our primary federal legislation, like the *Food and Drug Act*, and the *Canadian Environmental Protection Act*, have been made under that jurisdictional heading. I'll come back to that in a moment.

If we look at occupational health in general, most workers in Canada, approximately nine out of 10, in fact, come under the regulations of a provincial, not the federal government. The only people who are regulated and come under the federal jurisdiction are public servants, those engaged in certain industries defined as federal

responsibility in the constitution (and that would include inter-provincial transportation, banking and the Post Office) and others under the heading of peace, order and good governments (such as nuclear cycle, which was not thought about in 1867, and atomic energy workers).

That all sounds very complex and I thought it might help to just work through a couple of examples to show how this functions in practice. The first example is the question of pesticides. Under the *Federal Pest Control Products Act*, the safety and ecosystem effect of the pesticide is regulated under federal law. That includes an examination of safety with respect to human health and the ecosystems more widely. Under that legislation, because of its powers relating to inter-provincial trade and commerce, the labels are regulated and, of course, those labels in turn contain instructions for use and precautions during use. That may, in fact, extend to regulations whereby pesticides to be registered for use in Canada can be applied only by licensed applicators. At the same time, the provinces have jurisdiction over which pesticides can be used on which crops, at what time of the year, and the spray calendars. They are also responsible for licensing of applicators and, in turn, can put restrictions within the province on purchases, registration, and so on.

For example, let's look at radiation in dental offices. In this country, we have a national dose register operated by the federal government, which compiles lifetime histories of radiation workers in this country since 1954. The federal government monitors and reports back to the provinces any incidence of high doses. We are jointly involved in the follow-up of those incidences. All of this, of course, requires a great deal of coordination and I sometimes think that, in government circles, we spend far too much time just putting into place the mechanisms so that there is one good integrated system, which is well coordinated but not always very successful in achieving its goals in practice. But that is done either through informal mechanisms, formal mechanisms such as the Inter-Departmental Executive Committee for Pesticide Regulation, which brings together four departments of government in one board of directors to decide how the federal laws of pesticides are going to be administered, and Memoranda of Understanding between individual government departments, such as Health Canada and Environment Canada. But that looks after only the federal dimension.

Each sector, then, has its own federal/provincial coordinating mechanism. Under the Conference of Ministers of Health, there is a Committee on Environmental and Occupational Health, which brings to the table those in each province and the federal government who are involved in matters of environmental and occupational health. Often, there will be people at that table from Ministries of Health, Ministries of Environment, and Ministries of Labour from the same province, as in Ontario. Other provinces have slightly different arrangements. Among the Ministers of Labour, there is a committee of administrators of labour legislation, which has an occupational safety and health committee, and there is a Canadian Committee of Ministers of Environment.

The relationships with the Environment Ministers are not quite as advanced, but nevertheless there are ongoing discussions, which will probably revolve around development of a national strategy framework for health in the environment. All of that sounds very confusing, very complex, but it can work in practice and I'd like to give you an example of this. This is something that, in Canada, we call by the acronym *WHMIS*. WHMIS is pan-Canadian, integrated legislation at the two levels of government, federal and provincial, defining some aspects of workers' right-to-know. The acronym *WHMIS* stands for *workplace hazardous materials information system* and it is just that. It is not a regulator system. It doesn't do anything in terms of standards, but is based upon the premise that if workers and employers know what is in the substances they are handling, together with what are the hazards of those substances, then with appropriate training, the workers can do much to protect themselves. We are moving away from regulation into information, so that at the individual level, people can take care of themselves. That is built around the idea of a label on the product, which has certain product information such as pictograms to show the kinds of hazards, material safety data sheets (MSDS), and a training component describing how to use that information.

I mentioned that this is an integrated system but it uses the *Federal Hazardous Products Act*, which has control substances regulations, under which we have empowered provincial occupational safety and health inspectors to enforce the federal legislation. There are complementary provincial laws, which require that the workers and employers receive training to be able to understand that information and put it to good effect. The problems came with the thorny issue of trade secrets because industry did not wish to lose control over its trade secrets. A mechanism had to be devised to allow provision of information on labels, on MSDS, without disclosing the composition of certain substances. This applies to about one per cent of all workplace substances in Canada.

Just as an aside, perhaps I can mention that, as far as the federal government is concerned, the care and feeding of the WHMIS, in terms of policy development, arriving at understandings with provinces and so on, amounts to about \$600,000 a year. On the other hand, to protect the other one per cent, the trade secrets cost us over \$2 million a year. That's not a situation that we are very happy about. The way in which that was achieved was by setting up a Hazardous Materials Information Review Commission, which has a tripartite counsel of governors. It is supposed to operate by charging fees for looking at trade secrets.

The way in which it works in practice is that the Commission has a staff that initially determines whether the claim is a genuine trade secret claim. In other words, is there some intellectual property that has to be protected? If so, the hazard information is then turned over to Health Canada. Toxicologists in Health Canada who are sworn in especially for this purpose so that they do not divulge any information, review the MSDS and the labels, come to a conclusion and have the industry, if necessary, change those instruments accordingly. There is an appeal mechanism, where someone who is denied trade secrets status can appeal.

With certain exceptions, the occupational health standards in Canada are similar to those from the American Conference of Governmental Industrial Hygienists (ACGIH). Reference was made in the discussion this morning to problems not always pertaining to new substances but to substances that are already out there in the environment. Five years ago, new legislation was passed in Canada, the *Canadian Environmental Protection Act*, which attempted to address this question by setting up under the legislation a priority substances list, which is a list of substances developed by an outside advisory committee. It's not done by bureaucrats. It's done by people from the community, from industry, from the provinces and from environmental, non-governmental organizations selected by Ministers. They come up with a list of things that have to be evaluated to determine whether they are "toxic" or not. *Toxic* is in quote marks because it is defined in the Act but it is not what we usually think of as a definition of toxic. Rather, it means a hazardous exposure of the general population, either potential or real. The first list provided named 44 substances or groups of substances. In the Act, there is a built-in timetable. If the government doesn't do the evaluation within five years, there is a mechanism whereby it's taken out of Ministers' hands and referred to an independent board of review. We have just completed that and we are now developing the next list, which will have 100 substances or groups of substances evaluated by the year 2000.

What happens when something is declared toxic? The Ministers then have to put it onto a schedule and indicate what they are going to do to regulate it. The way in which we are protecting that — since I think 22 or so of the 44 substances were toxic, based upon the low-dose extrapolation procedures, which were discussed this morning — is to go to a priority-setting exercise to determine which is done first, based on carcinogenic potency (cancer risk). Most-potent substances will be dealt with before the less-potent ones. In terms of new substances, the regulations require that we should develop an inventory similar to the *Toxic Substances Control Act* (TOSCA) inventory that has been done. And we now require that if something is not on the domestic substances list, it is judged to be a new substance. Then we require that the minimum permissible data list from OECD should be provided for that substance before it is allowed on the market. Where substances are not on the domestic substances list, have never been in commerce in Canada, but have been in the European Community or the US, there is a separate list, called the *non-domestic substances list*, where the information requirements are relaxed because of the experience that is being gathered in other countries. The government is usually given 45 days, or in some cases 90 days, pre-market. If we have not raised questions or requested further information, that product goes on the market by default.

A couple of words about enforcement and compliance, which was talked about a good deal this morning. The essential thing, of course, is to ensure compliance with regulations. Enforcement is the big stick. Compliance policy in Canada now consists of using the tools of education, persuasion and reminders and to use prosecution only as the final resort, because that is not an efficient way to get compliance. It is very expensive and ties up our inspectors in court for a long time. Often, the findings may be trivial in today's economy. And we have had cases in the environmental field where companies have chosen to pollute because of the low value of the fines, which

meant that the fines became a license fee, in effect. That has been changed by the *Canadian Environmental Protection Act*, which allows for fines to be levied up to one million dollars a day for continuing offenses. Is this system a good model for NAFTA?

No, it is not. It is complex, because of the inter-jurisdictional features. There is no single window. There is no one place that some one manufacturer wishing to introduce a product in Canada can go to ensure that he is not breaking the law. It protects entrenched rights because of the problems of the constitution and it functions only through goodwill. I hope I have been able to show you there is a certain degree of that evidenced by systems such as WHMIS. What is the appropriate model for a shrinking world? To take advantage of modern communication techniques, to pool our scientific and technical resources and to share our experiences better.

**Dr. Donald Cole, Research Fellow, Environmental Health Program,
McMaster University, Canada**

I am going to try to complement some of what Dr. Hickman has said and, more particularly, look at the national situation, what kind of contaminants we have, some of the research and some of the human resource training we have in relation to environmental health. To begin with, what are our main pollution sources? This may be similar across the three countries. Organic pollution is in fact at the top of the list. Only then come the toxins and microbial contamination because that is regarded as one of the sources of pollution by some of the groups in Quebec working on the St. Lawrence River.

The document, *State of Canada's Environment*, pulled together data from across the country. It is the best we've got in terms of our state of the environment reporting. It indicates that the major source of hydrocarbon emissions is fuel combustion and it remains an ongoing problem. If we look at what that is leading to in the air, in case we feel too bleak, total suspended particulates are decreasing as well as a number of the others — carbon monoxide, sulphur dioxide, nitrogen dioxide, and lead, which has come down considerably since it was taken out of the gasoline here, although, unfortunately, gasoline with lead is still being shipped to Argentina. Ozone is still an ongoing problem in terms of contamination. Radioactivity is another good news story. It has decreased considerably since the 1950s and we are at really low levels here in Canada, to the point that most people don't talk about radioactivity. If we look at long-term organic chlorine in particular, — the ones that tend to stay in the ecosystem — this is a classic example of something whose use is being stopped but which is still very much present in our food chain. The levels of PCBs in breast milk have come down considerably but they're still certainly present and in some groups they are very much a concern, for instance, in the Arctic. We have figures for the main daily intake of PCBs from various foods — walrus, polar bear, fish — by female and male Inuit residents of Broughton Island in the Northwest Territories. Narwhal can give a daily intake of 20 micrograms, which is a fair bit, and that exceeds the guideline that is suggested by Health Canada.

Looking at some other pollutants, ones that are more a concern in indoor environments — and indoor air has consumed a considerable amount of time for both occupational health and public health people in our country — what is interesting is that a number of the ones that we are quite concerned about are actually higher in the indoor environment and the regulation of the indoor environment is actually filled with contradictions. Sometimes it's a Ministry of Labour responsibility, sometimes it's a local public health department. There is certainly a federal bipartite process with respect to indoor air, and it's basically one that is very hard to come to grips with, particularly since some of the risks that office workers face, some of what is attached to the indoor organic pollutants may in fact be workplace organization or stress components. Other areas that I think are important are basic things like housing and community infrastructure — by which I mean water, sanitation, etc. — and these are particularly important in our First Nation communities. They probably cause the greatest amount of morbidity. Environmental morbidity in Canada is usually measured through things like diarrhoea.

In terms of strategies to deal with some of these problems, Dr. Hickman has outlined some of the levels of government involvement and given some examples. I would like to give examples of initiatives that try to span the various groups and to try to deal with some of the problems almost on a problem-based focus. An example is the Municipal Industrial Strategy for Abatement in Ontario. This has involved a careful construction of stakeholder collaboration, wherein it is measured how much is being dumped into waters, after which is set up a system of monitoring on a regular basis, of which stakeholders would be in charge. This is reported to the provincial government and then targets for reduction are set. We are at the point of moving to targets for reduction and things are slowing down a little bit in Ontario at this point. But I think it has been a very successful strategy in actually giving us a map of how much is dumped where. It's much better if the industry and the municipality can do that themselves than if the Ministry of Environment is expected to do spot checks, because that would give a very partial picture. Municipalities have a pretty important role in a whole range of things outside the usual public works. A number of municipalities are setting up environmental protection offices to try to bring together the health aspects of the environment, not only the traditional public health sanitation and those kinds of issues, but also the contamination issues — contamination of water, contamination of air. The Environmental Protection Office in Toronto, for instance, has done a major report recently on air pollution, the various contributors in the metro area to ambient pollution and then some prioritization of which things ought to be dealt with first.

The other area that has been pretty important in Canada is the whole healthy communities movement — a lot of which has occurred outside usual governmental structures, although it has involved planning departments, health departments and others — consists of groups of citizens and others developing ideas about how they would like to make a healthier community. Those inevitably include such issues as changing the way transportation works, reorganizing the way or the location at which

manufacturing occurs, reorganizing some of the municipal departments. A lot of transformation has come about through those kinds of mechanisms and it is quite different from the usual sort of legislative framework.

Environmental assessments are another of the tools that are used. An example of health professionals participating in environmental assessments was a recent assessment for the Ontario Hydro Demand Supply Plan, where the Ontario Public Health Association became involved and, basically, put health on the agenda as one of the factors to be taken into account for any electricity generation process. I give examples of the good, and yet, fundamentally, in a lot of environmental health planning, jurisdictional gridlock is the problem. What are some of the ways to deal with that? I think the Round Table on Environment and Economy that came out of a task force on environment and economy at federal and provincial levels has been very important, particularly for ideas like sustainable development.

In terms of human resources, therefore, although as professionals we obviously think that we sometimes are the most important and certainly we provide a level of technical expertise, having people within industry — for instance, environmentalists and people-planners in municipalities who are very concerned about environment — is the major way to move environmental health forward. In terms of professional personnel trained for environmental health, environmental health officers are the main group: the local public health inspectors with local boards of health, or in the federal system, with the Medical Services Branch. There are also a number of people in Ministries of Environment who have a lot of technical expertise in toxicology, biology or chemical sciences, who will relate to the environment and eventually have an impact on human health. Clinicians are, basically, either in occupational medicine or in environmental medicine. Clinical ecology is not a formally recognized speciality in Canada, as I think it is in the US. There are very few clinicians who have a lot of experience with exposure histories, or with working with communities. This has shown up particularly where health professionals become involved in remedial action plans in contaminant areas around the Great Lakes, and often they have a sense of health services or clinical problems, but they cannot relate to a lot of the contaminant issues with which the stakeholders and the remedial action plan are dealing. I think that is a real area for work. There are, obviously, many other people — toxicologists, statisticians, biologists, ecologists, geographers — who are being trained in colleges and universities across Canada and they do much of the research. Research is done predominantly by universities, some of it by industry, certainly a fair bit also at the federal government level, and in the Health Protection Branch. There are some alliances across industries and one of the areas where Canada has really shown some impacts is respiratory health effects. Hospital admissions from ambient air pollution are an example of a major piece of research that has been ongoing and that has influenced the policy process and documented a fair bit of morbidity.

I would like to focus on one example of an area — the Great Lakes — and give you a bit more information about it. Niagara River has a large number of toxic waste sites that are still discharging into it and, despite efforts on both sides of the border, levels of contaminants in the water in Niagara-on-the-Lake, which is downstream from

Niagara Falls, are still going up. That is the bad-pocket story in the midst of what has generally been a pretty good story of contaminants in the Lakes. There are 11 critical pollutants on the International Joint Commission's primary track list. For those of you who don't know the International Joint Commission, it is something that came about at the turn of the century between Canada and the US to regulate, as much as anything, water-flow across the two borders. With a Great Lakes Water Quality Agreement, first in the 1960s and later modified in the 1970s and 1980s, it took on a major task to deal with toxic contamination in the Great Lakes. It has been a prime means of coordination and leverage between the two countries. At the Society of Occupational and Environmental Health meeting down in Washington, the Mexican and US colleagues on either side of the Rio Grande were very interested in the research coming out of the Great Lakes work and very interested in the model. The Border Health Commission didn't seem to have such a wide-ranging focus, or the leverage that the International Joint Commission has shown vis-à-vis our two respective governments.

So, in fact, a lot of things have actually improved. In particular, DDT and mercury levels have come down. Walleye collected in Lake Ste. Claire, one of the shared lakes, shows that these substances have come down considerably over the last couple of decades. The other thing that I think is very interesting in the Great Lakes is this move to actually try to look at ecosystem health. Ecosystems do not limit themselves to political boundaries, but in fact cross them. There has been a fair bit of work through a science advisory board looking at ecosystem health, with human health considered very much part of the ecosystem. We all have to situate ourselves within the ecosystem, because some of the decisions made about production, etc., are going to impact on the whole ecosystem. The effect on wildlife of contaminants is very much an index and has been used in the Great Lakes as an indicator of what might happen to humans. Some of the extrapolations have been a little wild, as in the recent International Joint Commission Report, *From Animals to Humans*, but the basic precept is there. This is a very interesting approach and one that I would like to see us try to consider as we look at our research options.

On another front, if we look at our sources of arctic pollution, where do they come from? This is nothing new to people, but in terms of the North American continent, a fair bit comes from the Gulf of Mexico area. So a lot of what ends up in our polar bear, our narwhal, what you saw going into First Nations people in the Northwest Territories, has come from the south. Toxaphene is the classic example and it is causing a great deal of concern. This is part of the reason that Canada has been quite involved and active in things like the study of long-range transport of air pollutants. That is one example of international cooperation. The other is some of the work IDRC has sponsored to actually develop products that can substitute for the toxic contaminants, for example, some of the work dealing with snails in Africa, which now look like they can be used against Zebra mussels in the Great Lakes. That kind of reduction in actual use is going to be very important.

Dr. Jean-Yves Savoie. Director General, IRSST, Quebec

Just briefly, I'll give you the history of the system in Canada. Roy has just told us the difference between federal and provincial jurisdiction. I think the first task really came from the act in Ontario and recommends adoption of a fair compensation law that would assume that the worker will be paid as long as the disability caused by the accident lasts. The major characteristic of the system, although they are different in all provinces, is that these are no-fault systems. They are public systems. The cost is covered by employers, it's a mutual fund principle and the rates range from 10 cents per \$100 salary to \$38 per \$100 salary, while the Canadian average is 1.6 to 3.6. Of course, one would assume that the most at-risk companies would pay a higher premium, and in fact it is that way. That might encourage prevention. This is a provincial jurisdiction, except for federal employees and certain institutions, as you have just seen.

There are 12 Worker Compensation Boards (WCB) in Canada. Even in the territories, where you have a population of about 30,000 people in the Yukon, there is a WCB. The Worker Compensation Boards have quasi-judicial powers and they have exclusive jurisdiction in worker compensation to decide all matters pertaining to legislation. The system covers all work accidents and also special diseases for each jurisdiction. The main difference is that if you have an accident, you don't have to prove it, but if you have an industrial disease, you have to prove that. I would say all the companies may not agree. Our system is not standard, except for industrial hygiene, chemicals and that type of thing, compared to European communities. The coverage is either cash compensation for wage-loss or disability benefits. Normally, it's about 90 per cent of net income, up to a maximum. Depending on the province, it could be \$27,000 or \$50,000. Of course, you are provided medical aid and rehabilitation services. In Quebec all the aspects of compensation and rehabilitation prevention and inspection are within the LLST and the LEPMP. They are all covered by the Commission santé sécurité du travail (CSST), which is the Worker Compensation Board in Quebec. So all three aspects are integrated. That's the only province where it's done. By comparison, in Ontario, there is the WCB. Prevention is mostly covered by the new agency that was created a few years ago. Inspection would be covered by the Ministry of Labour. So you have, within the same province, three different groups for intervention. Of course, in other provinces they sometimes manage to have prevention and inspection together and sometimes compensation with prevention. That, I think, is the case in British Columbia.

As far as the service delivered to the workers, in Quebec health and safety law you have provision for two things. One is a prevention program and one is a health program. The prevention program is the responsibility of the employer to implement and the health program is governed by health community services. It covers only half of the industries of Quebec. We have 30 industrial sectors in Quebec and up to two years ago, we covered 10 of these sectors. Now they try to do five more. The major handicap is that one of these five is government employees and the Treasury Board does not want to get involved. It involves the representative of prevention in each of the industries and that's very costly. I think that, in Ontario, WCB has clinics for

treatment of patients who have had an accident in industries. We don't have that in Quebec. It's all taken care of by the health system, but it's paid by the Commission. At present, it takes about two years to get therapy, though they are working toward a more efficient program.

But this system is raising quite a number of questions across Canada. First, the no-fault question, because employees cannot sue the employer for anything. Some people are challenging that now. Cost is another issue. Just in Quebec, over the last two years, the deficit has been larger than one-half a billion dollars, while the total cost was \$2 billion. The legal aspects are taking over. Every time you discuss health and safety with people, instead of discussing prevention, you discuss the legal cases. It takes you away from prevention. The basis for rehabilitation is either the right to return to work, as we have in Quebec, or the lump sum payment and departure. That is still argued because the efficiency of the right to return to work or rehabilitation are questioned all the time. And finally, the increased number of what I call diseases and accident-like injuries makes it very complicated. People are making claims on them, and we don't have any outside scientific data to treat them on a case-by-case basis.

Now, where does the research enter into that? I would say that the major contribution of research across Canada, if I take financing as an indicator, is from federal and provincial bodies. I don't know the amount of that contribution. Sometimes it's hard to isolate whether it's standing on environment, or health and safety, for instance, if you are talking about toxicology. On top of that, we have, in some of our 40 universities, dedicated centres for training and research, as well as solid research groups. In addition to that, we have two institutes, one of them the IRRST, which was created in 1980 and is a private non-profit corporation funded by the CSST. It deals with all aspects of inspection prevention and rehabilitation. In Ontario, you have the Worker Compensation Board, which gets its money from employers. Of course, if you are talking about research, with the money from the employers you will find out that international collaboration is not very high on the list of any institute, except among researchers. They say, "We have enough problems at home, why bother with someone else's problem?"

The IRRST has a larger mandate because of rehabilitation, which other institutes don't have. We have a funny situation in Quebec for the CSST and the IRSST. There is a bipartite board of directors, drawn from employers and unions. So all aspects of health and safety law, industrial diseases and industrial accidents are covered by this body and all standards are proposed by them, although they are officialized by government. Our mandate, of course, is to contribute through research to elimination at source of all risks and hazards to workers, and also to the rehabilitation process. In addition, we give grants to universities. All universities are subsidized by the Institute. So, you can see that in Canada, which is a small country, we have 12 separate systems. Very few specifically do research, although many of the WCBs can contribute to research in universities for specific mandates. I think that the only two provinces that have some specific money for research are Quebec and Ontario. Other provinces go through university contracts. Collaboration with outside countries because of that is, most of the time, on a scientific basis and not on other grounds.

Dr. Graham Gibbs, President, Safety Health Environment International Consultants, Alberta, Canada

Having worked for some of my life in government and in university and, currently, as a private consultant, I have a view, perhaps, of each of these perspectives. We have seen that there are certain areas that are federal responsibility and others that are provincial. I'm going to talk a little about provincial responsibility first. Apart from the areas Dr. Hickman showed you earlier, the provinces have responsibility to ensure that health and safety are maintained in the workplace. To do this, each of the provinces has its own Act and its own set of regulations. The processes that are followed in order to arrive at these regulations are quite varied, as are the nature of the regulations. Now you may say that strength lies in diversity and to some extent it does. But you can imagine this is a problem that we face in Canada. It's interesting though, that in most provinces we have employer and employee participation in the process. To varying degrees, employers and employees are involved in part of the process, which is a fairly new thing. Recently, some processes have been put in place, in Ontario for example, where there is a joint committee of workers and industry setting standards and developing a process whereby to achieve it. One of the interesting things is the change in direction in certain provinces. For example, in Alberta we have looked very much at performance standards. If we have had a standard in place for a company, that company must demonstrate to the government that it has an approach that will achieve that standard. Therefore, people are not locked into having to do it a certain way. It is a performance type of standard.

In the federal/provincial area, there are some informal things occurring. The Department of Labour facilitated the meeting of people to talk about some of the issues pending in the area of biotechnology. Some new approaches have been developed by industry. For example, the chemical industry introduced a rather interesting program, which I think has some tremendous benefits in terms of environmental health and occupational health. They would hold open houses, allowing people to go into the chemical plants and see the environmental data and the exposure data for the workers and for the community. That approach, on a community basis, is very effective in taking away some of the scare of the chemical industry, while, at the same time, making the industries commit to keeping safe environments.

Like every other jurisdiction in the world, Canada cannot inspect all its workplaces. There are not enough inspectors to do that. We do have fines and we do have jail terms written into most regulations. The most important thing about the regulation on a national scale is that everywhere there is a responsibility of the principal contractor. That means that the owner/operator of the plant has the responsibility to ensure the health and safety of its employees and those of sub-contractors. That responsibility is an extremely important one within the regulation.

In universities, we have training programs across Canada. Something we tend to forget is that, in the occupational health field, much of the education and training has been concentrated in faculties of medicine. In fact, the preventive component is really

more inherent here. We are just beginning to realize that and just beginning to move ever so slightly into these areas. If one looks at what we can learn from our past experience, I think the interaction between faculties is extremely important, in terms of getting young people trained, producing managers who understand what occupational health and safety are about, and engineers, architects and others who understand that proper design is extremely important. In colleges, we have technical training and practical training. In universities, we have undergraduate, graduate and post-graduate programs leading to a MSc. applied and a PhD. The MSc. applied program, which is offered at McGill, is an interesting one because it is a distance learning program. It permits people to do a Master's degree over a period of three years in occupational health sciences by coming in twice a year for short periods to participate in the program.

One of the problems that we encounter is that while we are preventing some fatalities, we are leaving people with permanent lifelong injuries, so that the cost, in fact, is going up vis-à-vis insurance because it's cheaper to kill people than to injure them. Safety is an area that is receiving a little bit of attention in some parts of the country but it's also an area that is only just under development. What about small businesses? One of the difficulties, I think, that we all face is that most of our workforce is employed in small industries. This is probably true in the US, in Canada and in Mexico. The large companies, if they are big enough and they can be motivated, can take care of themselves. I think they can do a good job. The difficulty we have is how to reach small industries. There are a few areas that have been tried in Canada, which are worth thinking about. The Quebec Sectoral Association — some other provinces have also developed sectoral associations — is an excellent way to get into small business. The problem is that Quebec and other parts of Canada are moving far too slowly with it. The idea here is that everybody within the industry sector can get together to examine problems applying to the whole sector. They can also look at global questions, and ways to collectively approach them with the help of other industries.

Dr. Annalee Yassi, Director, Occupational and Environmental Health Unit, University of Manitoba, Winnipeg, Canada

I have been asked to speak about worker health data, exposure records, the role of the trade union movement, worker clinics and joint health and safety committees, and to make some general comments on information systems. I thought I would use the framework of the three basic rights. I think these rights actually apply to environmental as well as to occupational health, although we tend to think of them in the occupational health context. The rights being: the right-to-know, the right-to-participate and the right-to-refuse. These really form the cornerstone of our occupational health and environmental health philosophy in Canada and there is much that can be learned from thinking about it in these terms. Exposure records, of course, fall under right-to-know, and we think about the content of what people are exposed to and about primary prevention. Health surveillance, in a sense, is also a right-to-know: a right to know how health has been affected. Putting worker clinics

under prevention is a little dicey because, of course, worker clinics have a role in primary and also secondary prevention. But, for lack of a better place, I put them there.

The joint health and safety committees are extremely important in actually operationalizing the right-to-participate with respect to occupational health and there are some other points I'll raise. Of course, the role of trade unions extends far beyond the issue of the right-to-refuse. With respect to exposure records, there are two points I want to make. First, with respect to research. Canada is better than many countries as concerns exposure records, and there are certain industries that are very good. People who are doing research in this country and everywhere else know how very difficult it is to do historical cohort studies, retrospective studies, because of the poor state of exposure records.

Canadians are proud of WHMIS in the same way they tend to be proud of our medicare system. WHMIS essentially works. There was agreement by the 13 governmental jurisdictions as well as by labour and management. Having a tripartite government agreement on anything is an accomplishment in Canada.

An entire industry has developed around the implementation of WHMIS in the workplace that has had environmental consequences as well as general consequences in occupational health. I think it is important to reiterate that not only good working conditions but also clean air, fresh water, adequate food, decent shelter and a stable ecosystem are important. When we talk about developing health surveillance systems under NAFTA, we should keep these sorts of things in mind.

There have been several initiatives in Canada that are worthy of highlighting. A Royal Commission on the Economic Union and Development Prospects for Canada was created even before the concept of sustainable development to examine the idea that, in order to prosper economically, Canada needs a better occupational health data system. It has already been mentioned that we have federal-provincial advisory committees that have called for various things, including better surveillance systems. The Canadian Centre for Occupational Health and Safety has had workshops throughout the country. There is a working group on occupational health statistics that has produced a report. Although we do not have one comprehensive occupational and environmental health surveillance system, there is some reason for optimism in Canada because there are initiatives under way.

What do we mean by surveillance systems? The existing system serves administrative purposes, worker compensation, the registries — what we call the passive as well as the active surveillance where you actually are doing health effects surveys. The general health care system in Canada provides excellent opportunities because there is, essentially, 100 per cent coverage. In some provinces, such as my own, the opportunities for research are excellent because within the health surveillance system, there is diagnostic coding on everything. Every time someone sees a doctor for anything whatsoever, not only just hospital visits, the reason for that visit is coded. Therefore, it could be used to see whether certain occupations have

a higher rate of visits to doctors for different complaints, concerns or illnesses. The weakness, of course, is that there are very few occupational codes that are included. Because of this, it has not been effectively used in occupational or environmental health. Worker compensation data have held the most promise as a health surveillance system. Because there is industry coding, occupational coding, we have a national registry that brings it all together. The weakness is that not everyone is covered by worker compensation. It is subject to reporting biases because not everyone files claims when they have problems. There are also adjudication differences, and it doesn't use a decent diagnostic coding system. Registry data are pretty good in Canada. The Canada mortality data base is excellent. This is a system where all the death certificates on anyone who died in Canada and in fact Canadians who have died elsewhere, including the US and other countries, are sent to this system. There have been quite a few successful studies. And, of course, heavy metal registries that exist in some provinces are quite useful. There are some weaknesses as well, but there is quite a bit of promise and we can talk about registries, perhaps, under NAFTA, as the kind of systems that we might want to exist.

In addition, there are the active systems, which are much more labour-intensive and research-oriented. Occupational medicine is really a recent specialty in Canada. In the past, even when professionals were sympathetic, they weren't well trained or there was a perceived heavy company-doctor orientation to those in the field. In the early pre-medicare days, some unions got clinics started for general health care. The Canadian Labour Movement has been very active in occupational health and safety for quite some time. It is quite true that a lot of people in unions or even shop floor workers, not just those that are employed by unions, know a lot more about the work-related illnesses than many medically trained people. And because of the lesser requirement for credentials, because we are less litigation-oriented in Canada than in the US, the unions have really taken a lot more initiative in this area. The Hamilton Workers' Clinic was one that was completely funded by one union Local. The Manitoba Federation of Labour Clinic, which is still operating quite effectively, is funded as a community health centre, so it receives government funding but is labour-controlled. The one in Alberta started off with just union donations and had some trouble because of that but has existed principally to service WCB work. It does not do medical work because it sends its referrals to the University of Alberta Clinic. The University of Alberta has a representative on the Board.

The clinics also tend to deal with environmental, not just occupational, problems. The degree of closeness to the unions varies among the clinics. They are not dependent on medical legal cases as such, which gives them a much broader scope.

With respect to the right to participate, I think these rights are extremely important in setting the tone for occupational and environmental health in Canada. Joint Health and Safety Committees are required in every province. Usually, it is something along the lines of this: where there are more than 20 workers, a joint committee is required and if there are less, a worker representative is required. Labour and management co-chair alternate meetings. The meetings have to have regular minutes kept. The workers' representatives must be elected, not appointed by management. In my

province, worker compensation rebates to employers who have good experience rating are tied to joint workplace safety and health committee activities, which tie prevention nicely in with the actual experience of injuries. We couldn't get a rebate for saving money without compensation until the Joint Health and Safety Committee signed off on different prevention programs that are in place. Because of the thrust of the internal responsibilities systems, which mainly means government does not want to run around inspecting, they'd rather each workplace take care of its own. Joint health and safety committees are very important. Having said that though, they aren't love-ins. There are often adversarial relationships between union and management. But, in general, the fact that they exist is important.

It is also important to stress that worker participation in research is something we often don't think about. But it is ethically, administratively and financially desirable to do so. What we mean by that is that if you have the workers involved, you don't have to worry about ethical pitfalls. Administratively, unions have a lot of valuable information that could help with the studies. Financially, they can contribute to finding the support necessary to do the studies. So we should keep this in mind in our further discussions. Also, in Canada, some people think of unions as being just occupational health bodies and sometimes even see them as working against advancements with respect to the environment. In Canada, it is fair to say that this, by and large, has not been true. In fact, unions have been involved in environmental legislation, for example, whistle-blowing on their employers for violating environmental regulations. Unions have increasingly seen the importance of linking occupational and environmental health.

The final, but not at all the least important of the rights is the right-to-refuse. Basically, if a worker refuses to do a job because of concerns about safety, there are legal safeguards against getting rid of that worker. Although, in practice, if that person is not unionized, he had better think very carefully about using the right, because management always finds ways to get rid of him. There is debate as to what's considered unsafe. Does it have to be unsafe for the average worker or is it just unsafe for that individual, given their susceptibilities? Informal work refusals are much more common than real work refusals. There is not a huge amount of work stoppage in industry because of the existence of this right. The original concern was that this legislation would cripple industry, but it didn't come about.

I don't have facts and figures to back me up. However, it seems that, in Canada, unions have a stronger and more militant presence than in the US. They certainly have a stronger presence in terms of per cent of the workforce that is unionized. It seems that unions are more self-reliant in occupational and environmental health issues than are their US counterparts. I cannot comment on the situation in Mexico. Perhaps it is because Canada is less litigation-oriented, therefore, the credentials of the experts are less important. So, if workers can acquire the information and if unions can handle the issues by themselves, they tend to do that a lot more. What is certainly true is that grievances about health and safety issues often occur in Canada. Health and safety issues are often brought to the bargaining table. Walkouts and work stoppages on health and safety issues are commonplace. Perhaps

most important, unions drive legislation. Often, new legislation is not based on the goodwill or some creativity on the part of occupational health professionals, but mirrors concessions already won by unions in negotiation. I have talked about joint health and safety committees. Ontario brought in that legislation only after 48 per cent of unionized workforces already had obtained them in bargaining. So we can't underestimate the importance of the union movement in driving occupational health.

Dr. John Markham, Canada

I'm going to briefly discuss the Canadian Centre for Occupational Health & Safety (CCOHS), not because it is a great success story, as a national institute, but because I think the question of national institutes, their nature and value is worth discussing. This is simply a case study of one. I happen to know it well because I was on the Professional and Scientific Advisory Committee that helped set it up in 1978. The Centre was a clear national need in view of this greatly fragmented system/non-system that you have just heard about. It was intended to give some national leadership in systems provisions, standardization, education and research. The purpose of the Act, which was passed in 1978, was "to promote the fundamental right of Canadians to a healthy and safe working environment by creating a national institute concerned with the study, encouragement and cooperative advancement of occupational health and safety in whose governing body the interests and concerns of workers, trade unions, employers, federal and provincial territorial authorities, professional and scientific communities and the general public will be represented."

However, when it was actually passed through Parliament, the then Minister of Labour had political needs and he passed the Act in the last half-hour of the session, eliminating the professional and scientific communities and the general public, thereby leaving us with trade/management unions and government representatives. The idea of the Act was to promote professional education, education of all kinds and research and information about occupational health and safety. In fact, what really happened was complete loss of the research and professional education roles because the tripartite Board decided it did not want to do that. It just wanted to give information to workers and management, if they wanted it, from existing technical information banks. It became a very useful information center for management, workers and governments.

Now the support grant has been reduced effectively to one-eighth and I would say that, leaving aside the useful technical information system and the occasional workshop, our existing federal institute of research is an example of non-enforcement, because the Act still has the original purposes of education and involvement of scientists printed in it. If only we could reenact the Act to include environment and occupational health, if that were an acceptable public policy, we could actually reintroduce the professional and scientific people and the public onto the Board of Governors. Then we might stop unions from being at loggerheads with professionals and we might help to bring about tougher occupational health and environment laws. The universities would benefit from a federal research and training plan, because the present provincial funding base for universities does not meet national needs in research or training in occupational or in environmental health.

DISCUSSION

Dr. Ellen Silbergeld, Senior Toxicologist, Environmental Defense Fund, USA

The question I would most like to ask our Canadian colleagues and perhaps also pose to our Mexican colleagues for their presentation to come is this: what do you see are the problems with your systems? Aside from the fact that they may be duplicative, and of course that arises from a federal history with which we sympathize, are there substantive issues and opportunities lost for health promotion and environmental protection to which you would point? Of course, you may not have problems. Then we can learn from your experience and example.

Dr. Jean Yves Savoie, Directeur Général, Institut de recherche en santé et en sécurité du travail, Montréal, Canada

People sometimes tend to focus on contested cases rather than to continue the implementation of prevention. Also, people — employers, unions and government — want to see an equation between the resources that were allowed and the benefit of different prevention measures, these being research, sectorial association, health community services and prevention programs. It's very difficult to prove the cost benefits of the research per se if you put it in a very narrow way. In addition, we have the recession. Costs are becoming very important. For the transport industries, the contribution for the CSST is as high as the benefits of the companies. It's a very high cost to pay. People will do anything to get out of the scheme. An example is the school bus. If you are a company under federal jurisdiction, you are not paid the provincial part of the prevention program, you pay only for compensation. For instance, if you are a school bus transporting kids once a year, you are going to take pensioners, bring them to Ottawa and say that you are inter-provincial and get off the scheme. If you have 20 employees, you have responsibility for them, but you don't have responsibility if you are lower than 20 employees. These are some of the issues where the purpose of the law that was intended was sectorial associations and the formation of health and safety committees.

Dr. Annalee Yassi, Canada

I don't disagree with anything that Dr. Savoie is saying. I was trying to make a list of what are the most important weaknesses in Canada, in no particular order of importance. Research is very poor in occupational and environmental health in Canada. The information systems are still quite lacking. Service provision is very uneven, with some large companies doing an excellent job of provision and many areas of the country having nothing. In general, there is inadequate inspectorate in many areas. The old phrase, "knowledge is power" has been answered by the equally important quote, "only power is power." Knowledge is clearly not the key to changing conditions, but it is a necessary prerequisite. I think that we can do a much better job in Canada than has been done thus far.

Prof. Jorma Rantanen, Finland

How are the confidentially-held data issue and regulators affecting, for instance, epidemiological research dealt with in Canada? We have problems in Nordic countries. The data protection system and legislation have not helped. But it has made epidemiological research difficult. This is one of the examples of legislation that has turned against its original purpose. Therefore, I am asking this point. Secondly, I would like to confirm what Dr. Markham told us about the Canadian Center. What we have found in different countries is that it is extremely important to have at least one centre of excellence in the country to collect information, deal with the national problems, make national situation analysis, distribute the information effectively, and carry out research. In developing countries, we try to establish at least one such centre. The country can then develop itself if you have established that. Therefore, I think the Canadian example, even though it was not implemented totally according to the original plan, is very positive. We have a lot of help from Canadians for our international activities, so we think very positively about that. Finally, I just had a strange experience in England a couple of days ago, where both the British government and British employers were saying seriously and vigorously that the time for trade unions is over. I would like to ask if you see this kind of trend in this part of the world. Because if it is true, we have to think about the strategies totally differently.

Dr. Graham Gibbs, Canada

In the research area, we've got this problem, of course, that we deal with a number of different provinces. But I think there are a couple of general points that we can make. The Canadian Mortality Database, which we heard about, is a very good example of where confidentiality comes into play. It is possible to get access to individual information on people from the Canadian Mortality Database if one gets full agreement from the parties, if you like, at the time of planning the research. Then it goes through a number of evaluations within the federal government prior to release of the information. It's also possible to do research using that database without using the names. You could provide them with the names and they'll give you back the numerical data. We know, in practice, the questions always arise later when you want to really look at some individual information to make some sense of some things. There are mechanisms to do that. A lot of the research is done in different provinces now, and very often there is a joint committee overseeing the research. So, a sort of steering committee is established and then access to information proceeds in order to do the studies.

I can remember when I was an advisor to the Atomic Energy Control Board, that there was a proposal that there should be elimination of all social insurance numbers from the database that Dr. Hickman talked about earlier. We should never then be able to recover any individual information on the exposures to radiation of people across the country. This would totally eliminate the usefulness of that database. But, from time to time, these pressures do arise. At this point, I think we can still do pretty good epidemiology in Canada. I'd like to tackle the third question, about unions. I don't

think unions are dead. I can think, certainly, of parts of Canada where unions are very strong at this point. Nevertheless, there are a lot of factors that are coming into play in Canada. In some of the major unions, there are some forward-thinking people who are looking at the role of unions being somewhat different. In Canada, there is a move in some areas like the chemical workers' unions for example, where they are looking at ways to achieve things without traditional adversarial methods.

Dr. Jean Yves Savoie, Canada

If I may add to that last point, in Quebec we have a solidarity fund, which is managed by a union. That fund gathers I don't know how many hundred million dollars a year to create jobs in companies that would otherwise close. So there is a lot of involvement that is quite different from what we have seen in the past. Second, we have things that we thought we never could have. The most vindicated union in Quebec, CSN, is the union that assigned the greatest number of social contracts, with employers lately saying that they won't be troubled for five, six, seven or eight years down the road. There is a change that reflects on health and safety matters. One problem though, is the difficulty of reaching small industries in Canada, which is a problem across the board. As for the CCOHS, it really achieved quite a few things over the years. But because of jurisdiction, the province of Ontario, which is a big province, said we didn't really need it. Quebec was out of it totally, and I even quit the Board because I was not representing anyone. Unfortunately, their role right at the early stages was kept for information purposes, and the other roles were not there, so they could not tackle major issues in Canada except in fora that they created. I don't know what is happening now. They have to be self-financed. I don't know how you can self-finance your health and safety information system.

Dr. John Markham, Canada

One thing that we miss is training of professionals, although the properly certified professionals in occupational medicine, for example, are only one type of professional. We have 41 in Canada for a population of 28 million, whereas Britain has 1200 for a population twice as large. We are a long way behind. I think hygienist education is difficult to finance. Only a province can finance education, and education is financed on a provincial basis if they can justify that training in that province. They can't meet a national need. I think that's one of the reasons we need a national center. And in research, again, many of the granting institutions are poorly funded in many of the provinces and they can fund only things that are of local interest. Something of national interest, like schemes for small industry systems in occupational and environment health, are very hard to fund. You need to have a national institution in order to do it.

Dr. Roy Hickman, Canada

From the point of view of WHMIS, there has been an assessment. Perhaps I should say that, when the federal act was passed, which perhaps was the kingpin for WHMIS, certain industry sectors were excluded, the principal ones being pesticides,

medical devices, drugs, fragrances and flavours. The legislation was passed on an understanding that there would be two more years allowed for reaching some consensus in those areas. In the case of WHMIS, the calculation was, and I am speaking from memory, something like \$10 million net benefit to having WHMIS, without the excluded industries. We are now in the process of going to Parliament to perhaps include the excluded industries and it's a political decision as to when and to what degree it will happen. But we have undertaken studies to determine what would be the impact of that. The impact then would be another four billion dollars. That's primarily because the excluded industries included things like radioactive substances, explosives, pesticides and so on, all of which, in the event of an accident, will usually lead to much greater costs. The cost-benefit evaluation was based on a comparison of the cost to two levels of government and employers of implementing WHMIS, compared with the estimated costs of benefits that would accrue from the information available and the worker and employer response to that. There was some hard data in that.

There is a magazine called *Occupational Health and Safety in Canada*, and in every single issue for the last many, many years there has been a column devoted to a WHMIS success story showing how a certain industry or company has implemented it. Implementing WHMIS means having brought in industrial hygienists, attending to a lot of issues in the workplace that otherwise would never have been addressed. So the spin-off benefits are generally seen by management and labour as having been immensely positive, quite apart from whether people can question the actual figures, the economics of it all. Employers are not complaining about the cost. It's really quite amazing. The vast majority of people who practise occupational medicine in Canada do so part-time. There are doctors in general practice who do occupational medicine for a few days a week, so it's difficult to get actual salary figures. Occupational medicine is not glamorous. Students are not clamouring to get into the specialty. We have very few residency slots, though, which is a problem. In other words, the number of funded positions to specialize in occupational medicine is in the order of four at this point. The numbers of people who can specialize in occupational medicine are thus extremely limited, but we don't have hundreds of people lining up for those four positions.

Dr. Jean Yves Savoie, Canada

Graham talked about the learning-distance course given at McGill. There are more applications now than they can handle, so there is a demand for it. There are facilities. So, I think this type of course, especially for people outside large cities, for example, in northwest Quebec or northwest Ontario, will be very popular and one way to answer the problem.

Dr. Graham Gibbs, Canada

If we look at occupational hygiene, we had, at McGill, a number of years ago, more applicants than we could take into the program. The difficulty that we are seeing at the moment in large part relates to the downturn in the economy, because there are

many companies that have occupational health programs with hygienists and they are laying the hygienists and their occupational physicians off. It isn't very encouraging for young people who want to go into that field. The Canadian Registration Board on Occupational Hygiene has been pushing for regulation that would require occupational hygiene to be written into legislation in the same way that engineers have written in that certain things can't happen unless an engineer signs off. This is in the hope that requirements would be strengthened and a profession recognized. There would be the need to achieve certain standards and, at the same time, there would be guaranteed work. On the medical end of things, there is no doubt that the main problem with occupational medicine is that, in universities and in medical schools, it certainly is not a priority. If students could skip a class, they would skip epidemiology. Nobody was interested in epidemiology. Very few were interested in occupational health. They all went to pathology or physiology. I think that part of it is really related to the education, if you like, of the existing physician group, so that, as time passes, in fact, occupational health will become part of the thinking. It's something that is going to be excluded as long as all the people who are in the training field think that the most important things are pathology and so on. We will have little impact on putting occupational health into their programs. It will be squeezed out of the curriculum.

Dr. Roberto Sánchez, Director, Department of Urban & Environmental Studies, College of the Northern Border, Mexico

It seems to me that our discussion has been very much focused on occupational aspects, leaving aside, to a great extent, the environmental issues. I would like to ask more about these. Concerning what appears to be a history of many Canadian successes, I have many questions; some of them, even if they are left without response, I would like to state. First of all, are there territorial differences, both in the form of the regulation and the type of standards existing in Canada, among the provinces? For example, I understand that the system is very complex, but what I should like to know is whether there are provincial differences, both in enforcement and in regulations. Another question I should like to put is how pollution problems that affect more than one province are resolved. In other words, how is trans-provincial contamination resolved? A further question concerns the WHMIS example; it seems to me interesting, but basically it has to do with the occupational question. Where there are national, provincial or local inventories of contaminant sources responsible for environmental pollution, are there studies about risk areas created by all those sources, and how is this information linked with institutions? If it is public information, can anyone have access to it? Concerning Canadian companies operating abroad, particularly with respect to access to information about dangerous materials, toxic products handled by such companies and standards applied, is there some legislation compelling companies to apply Canadian environmental occupational standards, or is this a free field? And what about the availability of the Canadian legal system in occupational or environmental legal demands for operating failures of those companies abroad?

A topic that seems very interesting to me is the handling of toxic and dangerous residues, particularly because Canada is one of the few countries that imports dangerous and toxic residues to be treated in its territory. I should like to know whether there is more information about how this is carried out, and if there are any studies available.

In the presentations, nothing was said about the existence of something equivalent to the Superfund of the United States, and whether this creates environmental problems. How is this resolved? Now, is the information of WHMIS also public information that any individual, any citizen, may have access to? Finally, a last comment concerning the role played by the labour unions: it seems to me that Dr. Hernández's proposal is important; perhaps it should be one of the research topics, not only in terms of the labour unions but with respect to other factors as well. For example, what role can Non-government organizations (NGOs) and other community groups play within the plans to define standards and, above all, in monitoring and control plans, etc.?

I believe that it is very important to bear in mind, as Dr. Rantanen was saying, what has been instituted in Great Britain, a plan that dates back to the Thatcher era, or the legacy of Thatcher-Reagan. It not only covers Great Britain, but extends itself to many countries and is applicable to all aspects of the market economy that go beyond the possibilities of the state-nation, or even beyond the provinces. We have to take into account how this would affect countries such as Mexico and Argentina, etc., as I imagine that this can apply to industrialized countries or be limited only to the southern countries, which are subject to many of these pressures as part of their economic growth. I believe, then, that this is a central point, which can be the perfect balance, or perhaps the more accessible balance at which we can arrive to solve this type of problem.

Dr. Roy Hickman, Canada

On the question of trans-boundary, province-to-province, or country-to-country pollution, I think it is fair to say that the federal government does have some responsibilities in terms of international trans-boundary pollution. In fact, that is looked after in legislation under the *Canadian Environmental Protection Act* (CEPA). This is not to say that we don't have urban concentrations, because we certainly do, but on the other hand, because of our vast distances and so on, we don't suffer in quite the way that more densely populated countries do. Certainly, the provinces are the recipients, for example, of acidic precipitation from the Ohio valley, and so on. We work together, the federal government acting as the mouthpiece but very much with provincial input as to what the national position is going to be in negotiating with the US on that particular issue. I think, in general, that we have established ourselves as a country that is credible in terms of raising issues and being prepared to come to the table to take action on these global pollution events. I draw your attention to the fact that the Montreal protocol was something that was pushed by other countries, too, but very much by Canada.

With respect to your questions relating in various ways to access to information, what I can tell you is, first, that any information belonging to the federal government can be accessed by any citizen on request. There are also some restrictions on that, because much of the information we have available actually belongs to third parties, and can be released only with the concurrence of the third party, unless the Minister says it is in the public interest, and that doesn't happen very often. The instances that I can think of, where in fact the Minister has used that power, have mainly been in the health field, where it's thought that the public health interest overrides the commercial interest of the third party. But having said that, I link this to something that was said about the trade unions earlier. In Canada, which is a relatively non-litigious country, certainly in comparison with the US, what tends to happen is that our industry associations and our trade unions work more smoothly together at the political level. For example, there are many instances where the Chemical Producers Association, which is the main synthetic chemicals industry trade association, has taken upon itself to produce inventories of air pollutants released from industrial enterprises and to make that information publicly available.

Dr. Donald Cole, Canada

There are a couple of provinces that have enacted environmental bills of rights, which give citizens some rights to gain information about contaminants occurring in their community, and to participate in environmental assessments of new projects in their communities. In fact, it's my impression that WHMIS has facilitated that process. There is a Chemical Producers Association program called *CARE*, which, because of WHMIS, finds it much easier to provide information about what's available to local municipality members and to community members who are part of decommissioning committees or whatever. In Ontario, the Occupational Health and Safety Act has a committee wherein information has to be provided to medical officers of health. That hasn't been fully enacted because of the difficulties regarding what to do with all the paper, as much as anything else. It's very much accepted that non-governmental organizations participate in, for instance, a lot of the work around the Great Lakes. There are inventories of hazardous waste sites in some of the provinces. Ontario and Quebec have them. Those data bases are not completely characterized, but they are accessible and provided by the Ministries of Environment to whomever would want them. In terms of Canadian companies acting overseas, I'm not sure of the actual legal standards. I know that there is certainly interest, sometimes headed up by occupational physicians applying similar standards, but my understanding is that there is no requirement under Canadian law for Canadian companies to act in a particular way overseas.

Dr. Roy Hickman, Canada

CEPA does have a section that relates to the export of hazardous, restricted, banned substances, which says the Canadian industries have to notify the importing country, but nothing beyond that.

THE MEXICAN SYSTEM

Dr. Mauricio Hernández, Mexico

I should like to make a small introduction by way of orientation. A development of the environmental culture has taken place in Mexico. This development has been considerable over the last few years, and there have been events that have helped us to understand what is happening, first, in examining the grave environmental contamination problem that exists in Mexico City and, second, in looking at industrial accidents that have taken place in Mexico City proper, as well as in the provinces. These accidents have had great national and international coverage, as has the signature of NAFTA. This event has forced all of us to think how are we going to take advantage of it to improve the health of the environment.

Having said this, I shall yield the floor to my Mexican colleagues. I should like to begin with Luis Fernando Hernández, who will deal with regulatory aspects; Guadalupe Aguilar will follow, speaking to us a little of the IMS, sharing some data with us, and this will give you an idea of Mexico's present situation. Fernando Díaz Barriga will speak about provincial or state aspects; as for me, if I have the time, I shall comment on the current status of research. Finally, Roberto Sánchez will make a statement about what is happening in the border region and the opportunity offered by NAFTA.

Dr. Luis Fernando Hernández Lezama, Department of Health, Mexico

I work with the Advisory Office of the Undersecretariat of Health Regulation in Mexico. This Department has a great responsibility in the occupational and environmental area. However, the structure of the legislation, as in other countries, makes enforcement somewhat difficult. What I am going to try to explain to you in a very precise manner is how the regulatory mechanisms operate, that is to say, where are the laws, where are these laws applied, what are the most important problems derived from the positions taken by these laws? Finally, I will give some examples, which are the result of what Mauricio was saying before, that is to say, the increasing interest in environmental development, especially over the last few years.

The application of all Mexican legislation has its origin in the constitution. Mexico's constitution has two basic areas, upon which rest all environmental and labour legislation. One of them deals with the general principle of protecting the environment, while the other deals with the general principles that govern worker-employer relationships. Subsequent to the Mexican constitution, there is a law that distributes competencies among the different departments. In Mexico, there are eighteen government departments and, in addition, currently there are thirty decentralized bodies with limited legal capacity. The Law, which is known as *Organic Law for the Public Administration of Mexico*, establishes competencies and jurisdictions for each department.

In the environmental field, it expressly establishes that its legislation depends on the coordinated action of the Department of Social Development and the Department of Health, which, as you will see later, makes the application of the legislation fairly difficult.

On the other hand, in labour matters, it establishes that labour legislation is a competence of the Department of Labour. This means that the *Work General Law* in Mexico is competent in occupational matters. It also assigns responsibilities to the Department of Health, whereby is created not only a duplication, but, in many instances, a competition, by virtue of the fact that the *Work General Law* introduces a certain priority into labour relations. This means that companies may negotiate labour relations directly with their workers. Consequently, this negotiation of labour relations, in some cases, may go beyond what the federal legislation determines in health matters.

In order for this to be applied, there are, then, basically three departments that have relations or that have certain competence in environmental and labour matters: the Department of Health, the Department of Labour, and the Department of Social Development. These, in turn, each has its own laws, i.e., *Law of Health*, the *Work General Law* and a federal law dealing with the ecology and protection of the environment.

However, as soon as we deal with specific topics, other departments come into the picture and this may have competence over the particular issue. For example, if we speak of pesticides, this is a competence of the Department of Agriculture, and this department introduces two important federal pieces of legislation: one dealing with animal health and the second with plant health. Also, with regard to pesticides, as Mexico does not generate molecules, it does not develop technology. Consequently, there is a high import level and, here, another legislation is also applicable: trade legislation, as it applies to international trade. All this, in the current context, is greatly affected by its relationship with NAFTA and other Treaties, such as the General Agreement on Tariffs and Trade (GATT), the Brazilea Agreement, wherein there are commitments to be attended to. We can say that this interferes with the interpretation given to the application of the Commerce or Trade Law.

If we speak of toxic substances, for example, we enter into the field of competence of the Department of Communications and Transportation. And, once again, the reason is that Mexico is a substances-importing country. Transportation of toxins through the national territory requires application of additional legislation. All this means that, occasionally, all applicable pieces of legislation may not be altogether compatible; then it becomes necessary to seek the most appropriate application or interpretation for these laws to be applied. If we speak of radiation or ionizing radiation, we would then be speaking of an additional Department, that being the Department of Energy, Mines and State Industries, which, in Mexico, fulfils its regulatory action through a national commission of nuclear safety.

On the other hand, if this is the legal framework, we have yet to deal with the territorial problem of applying these different laws; we have to speak of how they operate at the state level and the municipal level, depending upon the topic being discussed. In Mexico, there are 32 entities, of which 31 are states, the other being the Federal District. Each of them has its own local legislation. Most of the time, this local legislation reflects the federal legislation, although in its application it is not the same as the federal application. All this means that the political variable plays an important role when the law must be interpreted and applied.

On the other hand, in July 1993, Mexico published new legislation, called the *Federal Law on Metrology and Standardization*. This law established rules to complement the standards plan. This, in Mexico, is the competence of the President of the Executive: to issue regulations supporting the federal laws, although these regulations quite frequently are issued as technical regulations, with a high specifications content. This makes it quite difficult to be up-to-date in technological development, because all regulations may take four or five years to be amended. Then, most of the time, regulations are out-of-date for the events that are taking place, and when one tries to apply them, industry has legal grounds to say, "I am not going to comply with the regulations, because your legislation does not force me to."

This also gives rise to the fact that standards, which in Mexico are published as compulsory standards, could very well be different among the various departments. To mention just one example, when there was a standard about toxic substance containers, one of the departments issued a standard saying that containers should be destroyed by incineration. Another department issued a standard for the same product, stating that containers should never be incinerated, but buried underground. No one knew which standard to apply.

When this legislation was modified last year, the idea was to create a single standard, that is, departments are obliged, when two or more have competence over establishment of technical rules for a process or product, to issue these jointly; also, that a rule be drafted with participation by those affected by it and those responsible for its application. It must be a rule, the scientific and technological feasibility of which has been evaluated, a rule whose application may be feasible and supported by a cost-benefit evaluation, in order to see what problems or difficulties are entailed or what is to be its application mechanism.

This law also establishes that its regulation must incorporate the method whereby it will be evaluated, that it is complied with, and that said method can be applied by any private individual. This private individual may be accredited or recognized by the pertinent authority, being then empowered to issue a Standards Compliance Certificate. The company may have as many evaluations as it may wish, on the basis of its own good practices control or its own control of production processes and methods. Somehow, there is something that appears as progress and this is the real integration of these working groups.

The great problem behind all this is that, in many instances, legislations were applied on the basis of a federal regulatory model. Almost all of them were given by issuing an authorization to operate, even if this was through a registry, through a permit, or by recognizing some aspect of a process. These permits used to have a certain validity period. Most of the departmental resources were devoted to revising or renewing these permits. This left little time for, and even meant abandoning, training people to supervise companies to which a permit had been issued, with respect to compliance with the terms of the permit or employment of methods or control processes on the basis of which the permit had been granted.

Today, we can say that this continues to be one of the most important problems — the monitoring of compliance — as in the majority of cases this compliance is supervised by the states. The Federal District, which is where we shall see one of the examples of how these aspects have been handled, serves very well to reflect what happens throughout the entire country, because in the Federal District live 20 per cent of the country's population. Forty per cent of the national industry is also situated in the Federal District, and 60 per cent of the economic activity is concentrated there. For these reasons, many works and projects undertaken and carried out in the Federal District have a great repercussion throughout the national territory, which serves as a kind of testing laboratory. There is, however, a difficulty, and this is that problems established in the Federal District are generally magnified, because all existing resources are concentrated there. We can say that most of the technical resources available, as well as human resources and information, reside there. It follows, therefore, that it is an important concentration for decision-making power.

The example to which I wish expressly to refer is that of pesticides. In Mexico, pesticides, as you probably know through the work carried out under the framework of NAFTA, have been revised. Mexico has an organization, a Commission that encompasses the four departments with responsibilities for pesticide handling, and this organization receives, through a single window, all applications for registration, licences and permits that are issued for these products. It is also responsible for a unique evaluation and registration procedure. It has a catalogue containing the inventory of all products registered in Mexico and all plants handling these types of products. At present, the second phase of this process is installation of similar committees throughout all states in order to apply supervision similar to that carried out at the central government level.

Dr. Guadalupe Aguilar, Mexico

I will begin with this poem from a Chilean female poet, which says: "We must do our best in order for work to assume the appearance of rest and even of play in order to recover its love..." She said, I believe, that it is important to establish for ourselves an ideal of what the most important activity of man should be, an activity to which more than half of our life is devoted, and it must be something that would enrich us not only spiritually, but in all human aspects as well.

In Mexico, a regulation is issued by the authorities that is at the origin of the institutions that will be responsible for regulating what is environmental and occupational health. In a hierarchical order, the Constitution is the supreme body that rules all the activity in our country. It is the political constitution of the Mexican United States, proclaimed in 1917, following a revolution that took place in Mexico. As a result of a confrontation between opposing forces, a constitution was born. It has many and important social aspects on behalf of the workers, both in rural areas and in the cities, and in relationships between the political forces of the country.

Articles 4 and 123 instituted what would become the regulatory aspects of the worker-employer relationship, which is the *Work General Law*, published in 1931 and modified in 1970. In the area of occupational health, there were some amendments. This Law defines in general terms what are work risks, work accidents, or on-the-way-to-work accidents (as these are a part of the workers' responsibility) and occupational diseases. This gives us a table as to how these risks ought to be categorized as well as its subsequent effects for indemnity purposes, and when this should be made. It is from this federal work law that a series of regulations is derived, controlling safety conditions in the working environment that have a certain focus, although non-textual. It leaves some ambiguous terms, which had to be regulated, to the point of having generated more than twenty-one manuals about safety conditions. It refers to noise, chemical conditions, and maximum permissible levels. Noise standards are copied from the International Standards Organization (ISO). These regulate the preventive aspects of the working environment. The department responsible for issuing and supervising this type of regulations is the Department of Labour and Social Security.

This constitution creates the social security plan, which came into effect in 1943. It compels all employers to register all workers against working accidents. Its scope is federal. All workers covered by social security will be governed by the same laws. There are no activities or states that may opt out or regulate something less than what the Law grants in the way of worker health and safety. The most recent legislation is the *Health General Law*, promulgated in 1984, to which some amendments were introduced in 1991. The aspects of occupational health contemplated in this Law are few.

Among institutions responsible for monitoring compliance with health laws in the workplace is the Department of Health, which includes the General Directorate of Environmental Health and Basic Sanitation. One of the many mandates under its jurisdiction is to grant operating licences for all types of industrial processes. This is closely related to introduction or importation of risks into the country. Importation of risks into Mexico was regulated several years ago. Examples are asbestos and many other chemical and carcinogenic products, which were imported without prior amendment of the Mexican standard to reduce occupational exposure, as is the case in countries where such products originate.

The second institution responsible for supervising the health of the working population is the Department of Labour and Social Security. This institution oversees all aspects of preventing working accidents by deploying inspectors. The Department may

supervise this in two ways: one, through inspections, as does the Department of Health. These two Departments are legally authorized to impose sanctions on industries when they do not comply with Mexican standards. The other is the Department of Labour through its Public Prosecutor's Office in Defense of the Right of Workers (*Procuraduría de la Defensa del Trabajo*), where workers may present their claims that a working accident or illness may result from their profession or employment.

Through these two mechanisms, the Labour Department is responsible for monitoring or for exercising certain epidemiological supervision about some aspects of health in the workplace.

The third institution, which has only one competence assigned by this Law, because of the manner in which social security is organized, is not empowered to apply sanctions. It may only recommend, and one of its fundamental functions, apart from social security, which is its assistance function, establishes five types of insurance for working accidents, maternity, and illness in general. The group of illnesses in general covers disability processes or grants disability pensions to workers as a result of working accidents or other illness. This institute, to the extent contemplated in the worker compensation law, is responsible for providing the corresponding indemnities. One of its functions, which I believe is essential, is that of defining working risks and establishing compensation for these.

What is the importance of all this? One of the disadvantages is that it does not have legal authority to impose sanctions on any company that does not comply with the norms established in Mexico concerning occupational health. A second disadvantage is that this is the only institution in our country that produces information regarding the scope of the exposure of accidents to which workers are subject. There is also another agency that keeps a sub-registration system, but only to repair the consequences, or to provide an indemnity for the damage already caused. There are very few actions concerning preventive aspects.

The Health Department performs a series of inspections; this was done in 1991, when, of the 87 inspections performed, 85 per cent of the companies visited did not comply with safety standards. Of the 315 reports concerning 68 companies issued by Mixed Commissions on Hygiene and Safety, between 14 and 16.6 per cent failed to comply with the norms.

We said previously that the Department of Labour and Social Security has inspectors, whose primary role is to inspect aspects of occupational health in the years when Inspection Reports are examined in order to impose sanctions or to issue recommendations about changes to be introduced by a given company.

Even though this is not a homogenous behaviour, we see that, last year, 21 per cent of the companies did not comply with pertinent norms. And someone would say that 21 per cent is an acceptable percentage. However, if we examine the inspection reports, there is no mention anywhere of the type of dangerous materials being

handled, what is the raw material and its processing method. Basically, inspectors suffer from a training deficiency and they inspect superficial aspects such as dining rooms, toilets, or lockers where workers keep their personal belongings and clothing. This means that there is a great deficiency of knowledge of the magnitude of the problem to which workers are exposed, because, quite frequently, working processes are not included in the Inspection Reports.

With regard to norms presently in effect in Mexico, the Health Department, previously known as Department of Salubrity and Assistance, has issued twelve health norms. The Department of Labour and Social Security has twenty-two manuals, which are beginning to disappear. During the last few years, many revisions have been incorporated.

SECOFI, a Mexican database consultation service, which must intervene because of the large number of products being imported into the country, has issued 37 official norms concerning safety and 51 norms regarding industrial hygiene. We would have to point out that many of these have been issued since 1986 and there are several things in them that need modifying, as there has not been an exhaustive revision of these norms. With regard to SECOFI, it has introduced 28 norms for packing and shipping dangerous materials. This is, in essence, what we have in Mexico regarding official Mexican norms.

In 1992, for every 100 workers covered by worker compensation insurance, between one and six suffered a working accident. The three risks are: risk of working accident, accident-on-the way-to-work and professional illness. These are the items covered by the general heading of work risks.

What happens with social security insurance is that this agency evaluates all work risks, and not all leave a sequel or permanent disability. Consider the following data: there are approximately 800,000 companies covered by insurance against work risks. This covers only about 10 million workers. Mexico's active labour population is 40 million workers, yet only ten million workers are covered, even though this coverage is compulsory.

The management of the Social Security Insurance System is shared by three sectors. Government, employers and workers subsidize this institution, which is responsible not only for providing social security to the working population, such as medical attention, medical care for working accidents, working risks and disability pensions, but also to the workers' families, which are also covered by the medical care program. The three sectors are responsible for its financing: government, employers and workers. These are the three groups represented in the Technical Council, this being the highest body responsible for management of this institution.

I should like to make a parenthesis here concerning the role played by the labour unions. Representing the workers through the labour unions in this agency is very important because it is a formal representation. Actually, within the labour unions there is a real discussion of what their work risks are. The focus of their demands is

basically economic, as their salaries are fairly low. It is obvious that the economic aspect plays an important role in the revision of their collective agreements, and there is not a real consciousness of what it is to be exposed to a series of risks in the workplace. In our country, this is not a priority consideration, because economic survival is paramount.

If we look at professional illnesses, which we might expect to be higher, these are not the most important. Working accidents are. On the other hand, accidents-on-the-way-to-work have a certain tendency to increase as a result of the paternalistic attitude of the institution. Accidents-on-the-way-to-work occur between the moment the worker leaves the home until he/she reaches the place of work. Traffic accidents may take place, and these are absorbed by the institution. Accidents-on-the-way-to-work and all consequences are taken care of by the institution. It provides help to employers, as many have learned that many working accidents are classified as accidents on-the-way-to-work.

On average, five workers die every day in Mexico City. Disabilities refer to workers who are left with a permanent sequel following a work accident. Activities responsible for the greatest number of accidents and professional illness are the construction industry, followed by the metal-mechanic industry, the third place belonging to social security personnel. Work risks among health personnel are fourth.

Professional illnesses are higher in States with greater economic activity. Apart from border States, it is worth noting that Coahuila Hidalgo, (state with great mining activity), Chihuahua, and states such as the Nuevo Leon and Guadalajara, record the greatest concentration of industrial activity, but not the highest rate of professional illness.

Throughout this discussion, the expression *work risks* is being used time and again. Mexicans equate work risk with work accident. A risk does not necessarily evolve into an accident. Of 613,931 work risks processed in 1992, only 4 per cent left a permanent sequel among those affected.

Of all professional illnesses detected among workers, 98 per cent left a permanent sequel. Therefore, here the percentage is inverted regarding the work risks ratio. Working accidents or accidents-on-the-way-to-work in the end do not leave a permanent functional sequel to the point of preventing the worker from performing some type of activity. However, of the 7186 professional illnesses diagnosed, 7052 were left with a variable sequel. One is tempted to ask why the others did not leave any sequel. It happens that there is no evaluation for acute or chronic intoxications. That is, the Law does not admit an evaluation for problems of occupational dermatosis, even though there remains a permanent immunological sequel that does not have the right to be evaluated. There are deficiencies in the Law responsible for evaluating less than 100 per cent of all illnesses diagnosed.

I do not know whether you recall the statistical data I showed you at the beginning, where we saw that work risks had a more or less uniform behaviour, that is to say, according to the Department, not according to the directorate of Occupational Health Services, which is the agency responsible for indemnifying risks. But there is another Department called Safety and Hygiene, which is responsible for making a certain censorial examination and for monitoring compliance when a professional disease is detected. I recall the question asked by Dr. Hernández as to how Canada evaluated the SUIM program. It seems that, out of 35,000 companies, where most work risks were being generated, conditions of safety and hygiene were examined, and we saw that only 120 companies applied acceptable conditions of safety and hygiene. If we observe, we see that 43 per cent of these 35,000 companies were operating under unacceptable working conditions. If we make a comparison with moderately acceptable conditions, we obtain a very high percentage that would not correspond with the uniform behavioral aspect of work risks, when we see that safety and hygiene conditions through the different companies are deficient to a high degree.

Technological infrastructure is insufficient to undertake environmental monitoring studies employing ideal equipment. Quite frequently, inspectors make only a visual and summary check of all agents that might be present. Between 1991 and 1992, 13,000 companies were inspected by this means, and noise levels were above permissible levels in 36 per cent. Thermal conditions were altered, there were vibrations, lighting deficiencies and other aspects.

With regard to chemical agents, of this same total of 13,000 companies, it was seen that, in 24 per cent of them, residual powders from different processes were found. Powders constitute a problem. And this would be compatible with the fact that, in Mexico, number one of all professional illnesses is respiratory disease, whether brought about by silicosis or chronic bronchial problems caused by exposure to organic solvents. Second place is taken by professional deafness. And this is compatible with the study as regards the sensorial inspection of the two most important agents, noise and chemical powders found in the companies inspected.

Fernando Díaz Barriga, Coordinator, Environmental Toxicology Laboratory, Autonomous University of San Luis Potosí, Mexico

Our country suffers from a great many deficiencies. I work in a School of Medicine, one of the best in the country, where we had two options: either we accepted our deficient condition, or we fought to create our own system. We had the disadvantage of being a poor state, situated in central Mexico, as pointed out by one of my colleagues. Everything is centralized in the Federal District, which is the capital of the Republic, and in the cities of Monterrey and Guadalajara. The remaining States of Mexico actually receive very little attention. This is an economic disadvantage, although it constitutes an administrative advantage, because it enables us to generate our own action mechanisms.

In 1986-87, several problems were identified. The first was that a national system of environmental and occupational health required, above all, establishment of certified laboratories. The first problems encountered were that we did not have any equipment, hence the support we received from IDRC for equipment purposes. Joining several studies produced by Mexican universities, we have arrived at a preliminary list of toxic substances. The first five are lead, arsenic, isocyanates, toluene and selenium. Also, in some regions there are pesticides. In other words, we have metallic contaminants and organic compounds. The problem is that only 25 per cent of the states have laboratories equipped to quantify metals. This percentage is further reduced when we are analyzing organic compounds. Therefore, there is a great laboratory or technical deficiency in Mexico. What is the solution? There is a rapid solution proposed by the World Bank, which was taken advantage of to create five regional laboratories. Two have already been installed, although none of these regional laboratories will be situated in Mexico City.

The other specific action is that five universities have joined forces and, among ourselves, we are generating laboratory certification programs. This is something that is very important, because although lead is the main contaminant, in the Mexican province only two laboratories are certified to quantify lead content in the blood. And this is very serious, because it is frequently repeated that there is a great deal of lead in Mexico, but much of the information generated in our country is released by non-certified laboratories.

The first problem was that there were no laboratories. The second was that the few existing labs were not certified, and the third problem was that there is little real participation by the government health sector in solving the country's environmental problems. We now have a project underway at the university with state and federal government participation to teach evaluation methodology and risk characterization through identification of contaminated sites with dangerous residues. This is the first state program undertaken in Mexico. Another problem is that occupational surveys in Mexico are not being carried out, for two reasons. First, industry does not permit access to researchers, and I believe that this is happening all over the world. Second, labour unions do not permit access to researchers, for fear of losing their source of work if we identify occupational risks. What we are doing in two industries is talking with the labour union; we must convince it. And we have to convince the owners of industry. We have completed two very interesting studies: one about exposure to dangerous residues, and another about exposure to hydrofluoric acid, both studies having given extraordinary results.

A third problem, and the last I will mention, has to do with the scarcity of studies to identify risks peculiar to Mexico. For example, in our country, pesticides, which in your countries are no longer used, are still in use, such as methylparathion. We are introducing another type of pesticide, very new, which is said to be non-toxic, for example, pyrethroids. It happens that a metabolic interaction takes place between the methylparathion and the pyrethroid, which increases the toxicity of the mixture when both are used together. This you will not find in any legislation in the world. I have spoken with people from WHO, and in all probability they are not going to find any study dealing with this aspect, because it is not a problem found in industrialized countries. It is interesting that it is taking place in Mexico. Toxicology groups are therefore devoting themselves to the study of our own problems.

To conclude, there are no clear policies concerning environmental controls. Human resources and laboratories are lacking. What is most serious and dangerous is that we have no programs enabling us to overcome the limitations we have identified. As long as such programs are non-existent, we are forced to support personal initiatives. We will have to support interactions among universities, state government, federal government and industry. Above all, a system will have to be supported enabling interaction between occupational and environmental health. All this in order to make maximum use of available resources.

Dr. Mauricio Hernández, Mexico

Before yielding the floor to Dr. Sánchez to close this Mexican part, I should like to share with you some of the research data from a recently completed study showing the status of occupational and environmental health research in Mexico. And here, I wish to clarify that I am a firm believer that research aimed at solving essential problems is very important in the developing countries and that many times it is considered a luxury. However, we consider that research is basic to any progress.

Global statistics of the status of research in Mexico, as compared with that of other countries, show that Mexico has one of the lowest rates of personnel devoted to research. Mexico has nine persons devoted to research for each 10,000 people in the labour force, and we can compare these figures with those of other countries such as Germany, where the corresponding figure is 143; in Sweden it is 199. Mexico's National Council for Science and Technology (CONACYT), is the main research financier.

We undertook a bibliographic search for articles published from 1970 to 1990, which appeared in the *Index Medicus*. We were able to identify 102 published works. What is the meaning of all this? Well, on the one hand, it points out the existing national problem. We know that in Mexico only five per cent of the work presented before some congresses is published; five per cent of these are formally published, as a book or under other Mexican publication format. Not all Mexican publications are in the *Index Medicus*. If we check distribution by states, we see a high degree of centralization.

Of all articles examined, only twenty contained some type of statistical analysis and most of them dealt in averages or proportions, or in a test of the hypothesis. We consider this to be an important aspect of the quality of research — how the laboratory methods were described. There are very few certified laboratories in Mexico. Only five of the articles mentioned what the laboratory results were; 14 described the method, and in only one was the method not described; however, none presented standardized results, or criteria of outside validation. These results would indicate that, if we wish to strengthen Mexico's occupational and environmental research, it is necessary to make a large investment in human and technical resource training to achieve this.

Dr. Roberto Sánchez, Mexico

I work in a research institution of Northern Mexico called *Colegio de la Frontera Norte* (College of the Northern Border). Most of my work has to do with the environment and environmental health, and not so much with occupational health. What I would like to do, as part of the role of academic institutions, is to see differently the official perspective and, since today we wish to see both things, I should like to present some results of our work with environmental handling in Mexico. I should like to see environmental aspects under a broader perspective, going beyond legal questions or questions of surveillance and control.

First, what is the origin of these environmental problems? To begin with, equipment. In environmental protection there has been, for decades, a great neglect in legal terms as well as in enforcement of environmental protection, all of which has not kept pace with growth in the economy or population. Mexico is a country internationally classified as recently industrialized, with a farming and industrial structure that handles materials and substances potentially damaging to the environment and to the health of the working population.

Another cause or origin of environmental problems in Mexico is that they are covered only by relatively recent legislation, although the first attempt dates back to 1972. A broader and more complete legislation appears only in 1987. This legislation is still incomplete, because its regulatory provisions, which make it valid and applicable, are still very incomplete, even at the level of technical standards. Whereas in Mexico, at the end of last year, there were 86 environmental norms, this year another 80 are scheduled for publication, and at least 75 more will be published next year. In the other two countries, Canada and the United States, the number of environmental norms is considerably higher.

Traditionally, not much planning has been done in Mexico, and this has made it more difficult to solve existing problems. By planning, I mean environmental, urban or industrial. Some followers of the SFR might have found that growth was the ideal perspective, but for developing countries such as Mexico, this presents a serious problem. At this point, we would have to point out that part of the origin of the problems concerns the way in which the public sector confronts environmental protection and environmental handling in Mexico.

We would have to add that a sectoral and reactive approach is followed. But, what is meant by this? *Sectoral*, because it does not have a broad perspective embracing all problems, but operates sector-by-sector, without aiming at linking them. For example, when we deal with water pollution, handling of toxic or dangerous substances is not considered, though these may be, in the final analysis, the agents that are contaminating that source. And *reactive*, because responsible authorities react when a problem explodes, when it becomes public, and when it becomes an important issue. But, side-by-side with this sectoral-reactive policy, there is not a preventive policy helping us to control the problem, which is what would give us the means to prevent new problems from arising within a period of, let us say, fifteen years.

Finally, we have the inter-institutional communications problem. Despite the good examples referred to by Dr. Barriga, there are many other examples where a great separation or isolation exists between departments and between government agencies, which do not communicate among themselves or do not share information. This is a problem that affects not only Mexico, but many other countries. However, in Mexico's case, given its scarcity of resources, its effects are more important.

Another way of looking at environmental problems is the manner in which they physically manifest themselves, in other words, their formal aspects. If we admit that we have problems of air, water and soil contamination, which have an impact upon resources and upon the environment and health, we could also add occupational problems, which are linked with three critical aspects: industry, agriculture and the urban environment. In the case of Mexico, the urban aspects are important, but it is not necessarily so in Canada or the United States. This is because of an incomplete urbanization process, which is characteristic of the developing countries, since the lack of public services has a great impact upon environmental health as well as upon the condition of the environment. I am thinking in terms of drinking water, drainage, solid wastes, green areas, etc.

What is interesting is that these formal aspects are where all attention has been concentrated when considering environmental problems in Mexico, particularly in discussions about NAFTA. And this explains that not much has been said about structural aspects, as this would provide us with better alternatives to control these problems.

I should like to emphasize that there is a great shortage of human, technical and material resources. As for human resources, I am speaking not only of a technician who may go and inspect a plant or a farming area. I refer also to people with planning ability, able to work both with the public and the private sector, environmental auditors, again both public and private sector, human auditors of occupational health and of environmental health, and, in general, people able to participate directly with the authorities. By *technicians*, Dr. Barriga was referring to certified laboratories. There is no doubt that this is going to be one of the greatest stumbling blocks for implementing NAFTA, because many of the commercial differences resulting from the Agreement will have, in all probability, an environmental origin, not necessarily

justified, but an environmental argument behind every disagreement. And these disagreements, unless they are backed up by certified laboratories, will lead to conflicting situations in their resolution.

Under technical resources, I would also include equipment to check upon or follow up the quality of the environmental inspection. Regrettably, there is an impressive national shortage of this type of installation in Mexico. As for material resources, these range from computerized systems to handle this information, up to and including resources, which in many situations may seem ridiculous, such as vehicles for field work.

These resources are important for policy formulation, for legislation, and for what is referred to as enforcement, which I would translate as supervision and control. What is important is that those resources are vital if we think in terms of federal, state or municipal resources. Let me tell you why. In the context of its environmental policy, last year Mexico began to implement a decentralization process. Until then, environmental policy had been a federal matter, and that environmental policy, as of last year, begins to transfer part of supervision and control functions to the states, and in a few cases to the municipalities.

The current problem of the exact definition of jurisdictions between states and federation, that is to say, who is responsible for what, who must supervise and control what, etc., is being added. This is because, in most of the states and municipalities, environmental legislation is still incomplete. In the majority of cases, they lack the corresponding regulations, or do not have staff to supervise its application — that is, people able to supervise and think in the future in order to prevent problems from occurring. Mechanisms to avoid repetitive questions of environmental and occupational health are lacking.

And this deficiency is still more serious at the local level. So serious, in fact, that many communities or states are forced to muddle through this period of decentralization of the environmental question in Mexico without any resources. And what is important is that this produces an environmental gap. Mexico has entered into an economic interaction process with Canada and the United States through NAFTA. Decentralization of environmental supervision is becoming a reality in Mexico, and as a result of that gap, which is going to take us at least five years to bridge, numerous problems will arise.

As for structural aspects, we would have to mention the scarcity of information. No national, regional, state or local inventories exist to deal with potential polluting sources, where they are located, what types of sources there are, their characteristics, contamination tests, etc. This is true even when referring to vital aspects such as air quality, excluding the three large Mexican cities that have a network to monitor air quality, and this monitoring system has been introduced just in the last few years. In remaining cities, problems are generally limited to the total of air suspended particles, without following up other problems.

As for water, this is a more critical situation, and we have very little information. What is important to point out by way of information is that Mexico does not have a process similar to that of Canada or the United States, whereby the citizenry has a right to access information. The information, when available, is in the hands of and controlled by public authorities. It is not readily accessible to other participants in the environmental equation, such as NGOs, universities, etc. Even universities, which could represent an important link with the public sector, are forced to fight to obtain their own information, sometimes against the public sector itself, although this is not always the case.

Finally, within the structural aspects, something that seems to me important is that, in order to be able to find a solution to these problems, participation beyond the public sector is necessary. However, something is beginning to emerge in Mexico, and this is the role of NGOs.

Unfortunately, even though the number of NGOs has increased considerably, many are still too weak to be able to apply even minimum pressure. Another problem is that, in Mexico, many of these organizations do not have a national or regional structure, as is the case in Canada or the United States, which would give them a capacity to negotiate or to apply pressure to public, private or economic sectors.

But other actors are beginning to emerge. Among these is a new industry forming as part of the reaction generated by all this information and criticism resulting from NAFTA. Within chambers of industry, environmental units are being created. Although this does not imply better supervision, it means that a consciousness is beginning to emerge, a new actor that must be taken into account when handling problems, particularly in the search for strategies. Labour unions play a role, especially in what concerns occupational health, and here we would have to look for strategies enabling the labour unions to guarantee or take into account their own preoccupation with preserving their places of work, trying at the same time to incorporate many occupational health concerns.

In our own working experience, especially with the *maquiladora* industries, we have learned that this abandonment of occupational health concerns is not part of the agenda, because of lack of information. Workers in general do not have information about the type of risks they confront in their places of work, even if, under the best circumstances, they are given protective equipment, as we have found in some industrial plants, where gloves, face masks or other types of protection equipment are used. Workers are not given complementary information; in other words, they are not told anything about the substance being handled, its type, and what harmful potential it could have upon the worker if the protection equipment is not used. The end result is that, quite frequently, workers see this protection equipment as an encumbrance, because in many occasions it prevents manual operation. Finally, they decide to remove it, and continue being exposed to danger. There are other new groups of actors — community groups, district organizations — that are beginning to concern themselves with the problem of environmental and occupational health.

To conclude, I should like to mention two or three things: I am sure that this is going to be expanded in the next few years, and this is why I am not going to extend myself with what this has to do with NAFTA, nor with what I have just said. First, from my own perspective, I should point out that implementing NAFTA involves, no doubt, risks for the three countries. But perhaps risk concentration is greater as regards Mexico, in comparison with the other two countries. At the same time, it opens up opportunities enabling us to ponder the problems we have just examined, although, perhaps, without finding solutions. They will allow a certain potential to reduce risks.

Two other aspects are critical. Issues discussed with respect to NAFTA in environmental and occupational health were approached in an incomplete fashion. That is to say, they were focused as strictly formal aspects of the problem. In other words, they refer to industrial contamination, discharges of untreated waters, and atmospheric emissions. No attention was given to structural aspects. As a result, all the good proposals that have emerged until now from the NAFTA discussions have concentrated on solving specific problems, for example, creating a water treatment plant in a city or controlling water emissions from a plant. They have not dealt with solving structural problems that may help us, thinking particularly of the Mexican side, to prevent the repetitive sequence of these problems, which will continue over the medium and long term.

The second aspect that seems to me important concerning this incomplete approach in the NAFTA discussion is that it concentrated itself on industrial urban problems. A great deal has been said of the *maquiladora*. Much has also been said about residual waters and public services, but nothing was said, for example, about agricultural problems, agro-chemical product-handling, or about the many millions of workers who are exposed to them.

Finally, the approach was specifically directed to the fact that most of the attention was fixed on the northern border, even though we are talking about national and not regional problems. The industrial sites of many of these effects are not going to be concentrated only in the northern border, but throughout the country. An important consequence is that proposals and promised funds are being channelled toward the border region, at the expense of the rest of the country.

In terms of opportunities, although it has been pointed out as a problem, we would have to say that many aspects not yet defined within NAFTA may provide opportunities, while at the same time they contain risks. Opportunities, because the institutions that have been promoted as a result of the negotiations, especially of the parallel or supplementary agreements have already materialized, though they are only in the formative stage. Above all, their role, although to some extent defined, is open to extension or amendment, depending on the type of procedure or management that may be adopted in the three countries. Perhaps one of the important results of meetings such as these is precisely to define where specific short-, medium- and long-term actions may be taken in the definition of strategies. As for commitment, in the

analysis of existing documents, one detects a rather vague commitment, which can be improved, depending, once again, upon the pressures applied and strategies that may be adopted.

Finally, there is no agenda for times or resources. Perhaps time is the most important variable of our work. It is as important to establish times as it is resources, with respect to those times, in order that strategies may be implemented.

DISCUSSION

Question

I was interested to hear more about your system for recording accidents, injuries, sickness and absenteeism. Can you tell us quickly what your database is?

Dr. Guadalupe Aguilar, Mexico

The Mexican Institute of Social Security (IMSS) has 36 delegations: one for each state of the Republic and four that correspond to the valley of Mexico, embracing the capital and surrounding areas within the valley of Mexico. There are four delegations where the majority of industries are situated. The Institute has, throughout the states of the Republic, an organization known as Coordination Delegations of Occupational Health, one in each state. Depending on the number of companies, there are operational systems, where a physician is installed at the plant and is responsible for registration of all working accidents. Each worker involved in a working accident receives a special form in which to register his accident. The report reaches the plant physician, who is responsible for determining whether the accident is work-induced. The same happens with professional diseases; the physician detects and studies them, although this process takes longer.

There is a system referred to as *sole information system*, which is under the care of the IMSS. In its headquarters in the capital, all reports received from the operational services of each state throughout the Republic are kept under a branch known as Directorate of Health Services. There is another mechanism whereby information is received, and this occurs when a worker makes a claim for a professional illness. This claim is examined by the Mexican courts or by the Arbitration and Conciliation Board. This occurs in cases where a worker demands some indemnity to compensate for a consequence of a working accident or for a professional illness. There are two expert physicians, one representing the Arbitration and Conciliation Board in defense of the worker, the other representing the Medical Institute, because either the firm or the IMSS may be sued. Depending upon the judgement, this information is sent to the IMSS, which is responsible for responding to the demand, because in the final analysis it is the IMSS that will compensate the worker for the consequences of his working accident.

Question

Is there some place where data about illness and other conditions related to environmental exposures would be collected?

Mexican Delegation

Great efforts are being made to gather environmental information and relate it to aspects of environmental health. An important part of that information is concentrated in two branches of the Department of Social Development: the National Ecology Institute and the Federal Environmental Protection Agency. However, this effort is not yet complete, as it is an ongoing process. It has serious flaws, in terms of the type and quality of the information collected. During the last four or five years, that very department made efforts to conduct a national industrial survey in order for the information to serve as basis. Not all answers were satisfactory. There were deficiencies and these still persist, for example, incomplete registration of industries in operation. No records are available of atmospheric emissions declarations or residual water discharges and part of the information available is kept by the delegations throughout each state of the Republic. I know that the National Ecology Institute intends to make a national compilation of this information. In addition to each state conserving its own registry, there is a central gathering point in the capital. Another important aspect is that the Department of Health does not have its information centralized. There are investigation centres. Some of these have information that, in principle, will be collected by the National Information Centre, although there is an important imbalance in all of this.

I should like to take advantage of this question to comment about the triangle Professor Rantanen presented yesterday. Our experience is the opposite. That is to say, it is easier in Mexico to collect information on status of the environment and environmental health than on occupational health.

With the information we are able to collect about environmental health, especially under the umbrella of the public health topic — particularly after the terrible explosion of Guadalajara and a few other cases, such as one the previous year at a Cordoba agro-chemical plant — we were able to create, by Presidential decree, two systems of civil safety in each of the cities of the Republic. This is beginning to be carried out. In many of these cities, there exists only the initial declaration, although there are others that are beginning to make some progress. This is enabling us to collect industrial information, in many of the cases, through existing public registries. That information allows us to have a perspective of potential environmental risks. It also allows us to look inward — something we have not done — to what the potential occupational health hazards for the workers might be. All efforts made by Mexico are, above all, on behalf of industry. Very little data is available about environmental records that exist in agricultural areas.

As you know, chiefly in the Federal District, we have experienced some peak contamination situations, and the effects upon health had to be evaluated to determine when an emergency plan must come into effect. What has been in operation until now is a series of health personnel groups. As soon as a critical contamination period arises, 24 hours and 72 hours later, the groups undertake a detailed examination of certain city areas. Normally, a series of city areas is defined, and the above-mentioned health group takes pertinent data and returns 24 hours later to collect the same information, repeating the process 72 hours later. At the same time, all centres providing medical attention identify certain special areas. These are special services solely for the purpose of providing answers about environmental hazards. Those who, for whatever reason, suffer from a disturbance, a chronic illness, or from the acute presence of a symptom immediately visit these locations, returning every 24 hours. This is followed by a monthly analysis to determine what will be the most efficient care that may be provided.

At present, we are trying to do something similar in all states, introducing a similar system for pesticide intoxications or for any other type of toxic or dangerous substance. The idea is that the personnel consist of people able to determine immediately what is the more frequent symptomatology in given areas, and, starting from there, to be able to make a better medical care service plan, as well as patient-transfer and counter-transfer, depending upon the moment in which we can detect a toxic effect as a result of any exposure to any environmental agent. This is, more or less, the manner in which we are detecting those affected by environmental reactions.

It is safe to say that Mexico has not cultivated the public information concept, in the sense that any individual may have access to it. The information exists, but it is difficult to obtain, it being necessary to go through a great deal of red tape. One must have a friend to lend it to you. Nevertheless, important advances have been made. At least in Mexico City, the environmental monitoring network is now public and we now have a direct computer line. We can unload information minute-by-minute as it comes into the computer. This advance is very useful indeed, but we have a long road ahead of us. The most important part, or the most inaccessible part, is industrial information, although I can see a positive change taking place in the public information concept.

Professor Jorma Rantanen, Finland

So far as I understand, Mexico has a rather extensive health care system, including occupational health services for workers, which is maintained and financed by the social security system. What is the percentage of the workforce covered by that service system and do the activities of that service include preventive and workplace-oriented activities or are they only worker-oriented occupational medical care and clinical care types of activities?

Mexican Delegation

The percentage that was mentioned yesterday was 800,000 companies grouping close to only 10 million workers. Mexico's economically active population is about 40 million workers. Agricultural workers, for example, who are not included, are not covered by Social Security. Basically, it is the industries or civil servants who are covered. There is no overall record of working accidents or hazards in the workplace. With workers in the oil industry, there are other differences, although there are no information systems enabling us to see how working hazards are behaving, as this is a state company and it keeps its own records.

It is very difficult to access this type of information. What is available by way of records regarding working accidents would cover only 25 per cent of the economically active population, which is covered by the Mexican Institute of Social Security. This Institute, basically, is responsible for paying compensation. The medical care aspects fall under general medical care services. Under reporting, there is a great deficiency in the ability of medical care services to detect professional illnesses, because when they are detected, it becomes very difficult to have access to information kept by the companies, as they realize that they are going to be investigated with regard to a professional illness, and this would necessarily involve the Social Security system. As soon as a professional illness is detected as a result of a claim made by a worker, and the physician realizes that there is a problem, a system of epidemiological surveillance could be established in the firm where the case was detected. However, there is no legal possibility to compel the firm to perform this type of epidemiological surveillance.

Dr. Jean Yves Savoie, Canada

I am a little bit puzzled because, yesterday, among the notes I took, it was said that, in both the occupational health and the environmental health fields, there really was no right of access to information. And now you are saying that, in principle, there is access, though it is difficult. So in fact, what are the data collected really used for? In other words, are they used just to do statistics or are they really used as a basis for a minimum of action?

Mexican Delegation

In my opinion, your confusion is justified, because in Mexico we are going through a transition period. Changes are taking place with great speed. Until about a year ago, access to information was difficult, and in certain areas it continues to be difficult. But events are beginning to modify certain structures. This is what Dr. Hernández was referring to. For example, in Mexico City's case, which is the only instance with public access to a monitoring network, this access was not free of charge. It was achieved thanks to public pressure requesting that information. Since it was a very special case and it was evident that problems existed, public pressure applied by a city with a population of 20 million inhabitants was too great for the government to resist. Access to information became possible. In other

cases, such a radical change has not been possible, although it is coming, but rather slowly. There are areas where such information exists, and that information, through certain mechanisms, may lead to a useful and practical purpose. That would mean more studies, getting a better perspective on the current situation, etc.

We are even beginning to have cooperation with state and municipal governments outside Mexico City, because they are beginning to be concerned. Because of their greater consciousness, they realize that this information is not available, they require it and are beginning to have access to it. In some cases, this has helped. Academic institutions support this process, and there are municipal governments seeking our help to collect this information and to apply it to a practical end. But this is not always the case. As a result, the confusion I was referring to at the beginning seems to me justified. We are in this process of change, despite which, in some fields, we can take advantage of this opening structure. As I pointed out about social security, we can have access to a certain amount of information, which, without that medium, would be difficult to obtain. Government and industry are perfectly entitled to refuse information, and there is nothing we can do to access it. We are using many indirect ways.

Dr. Fernando Díaz Barriga, Mexico

I only wish to mention an example from our country, and this is the National Registry of Congenital Malformations, which, at least in San Luis Potosi, is used to check if there are environmental hazards. I know that, in other states of the Republic, there are other institutions that follow, day-by-day, this registry to determine whether there are toxic substances. On the other hand, I believe that there is a valid question with respect to the small number of information systems that exist, and the quality control of that information. From my own experience, I believe that the best information is obtained from the universities, not from official institutions.

Mexican Delegation

I should like to mention that, with regard to existing information, this is almost confidential, and one has access to it because the individual that seeks it works in that institution; it is not available to the public. For example, there is a library of health services in the workplace. Only physicians who work in that institution have access to that information. There is no statistical analysis of that information. Only round figures are given, rough figures that limit analysis from which could be made prevention programs.

This prevents us from knowing the scope of the exposure of workers to a series of substances and agents. A specific example is information about imports of agro-chemical products, and many other chemical substances used in the country. SECOFI must have import data. Even if this information is provided, it is difficult to analyze it because no information is given about what type of industry is using

it, in what quantities or in what type of process. As a result, no one knows how many workers may be exposed by those processes. Then, the question is not only information, but its analysis and the usefulness of that type of information.

Canadian Delegation

Yesterday, there was frequent mention of the shortage of resources for laboratory services in Mexico. Are there, in Mexico, private laboratories growing up as ours have in Canada and the States and could these be used for research purposes?

Mexican Delegation

I don't know whether I am happy or sad in answering this question, because the answer is yes. Every day there are more private laboratories. In the main, these come as multinationals, that is to say, large private laboratories from the United States devoted to environmental questions. This may be good, but it also can be bad because they are pulling people from universities, offering employment in those laboratories. As a result, universities are losing their good people. Therefore, we are not training. Every day there are more labs in our country that, incidentally, charge very high prices.

With regard to those laboratories, at the Occupational Health Services Directorate there are people trained as specialists in Occupational Health. There are 385 specialists and four very well equipped toxicology laboratories. The problem is that some of those laboratories do not have enough trained human resources. Another problem is budgetary, since they are financed by the state and by companies. Frequently, some laboratory reagents are not ordered or are ordered several months after they are required. This prevents proper lab operation.

Prof. Jorma Rantanen, Finland

When I listen to this discussion, I think you are in about the same situation faced in Europe a few years ago. And what we did there — it was a WHO office that organized it — was to make a simple survey of national systems. May I propose that it would be profitable that one experienced senior from each country write down an outline of systems of the country for both occupational health and environmental health — things like legislation, administration, coverage of the system, main activities and contents of the services, financial background, financial basis, information systems, manpower resources available, etc?

Dr. John Markham, Canada

One of the things the great Dr. Sven Forssman stressed to me was the importance of having a national institute in each country, which is semi-independent, represents the service-providers, represents the people who are at need in the country, and tries to provide guidance on the adequacy of the systems in the

country, and the shortcomings, on a semi-independent but concerned basis. It should also provide research, and education or leadership. Do you have such a thing in Mexico?

Mexican Delegation

I would say no. In other words, there is no institution assuming all these functions. There is, obviously, the Mexican Social Security Institute, as a leader in providing care to the working population, and it provides the service. On the other hand, there are regulatory institutions, the Health Department, the Department of Labour, and the relationships they maintain with the Department of Agriculture and SECOFI. But there is no Institute as such.

What we have, and perhaps through this type of initiative we could strengthen it, is a network of complementary institutions, such as the National Public Health Institute, and other institutions from the university where Dr. Barriga works. In principle, these institutions are beginning to pool their resources. They have formed a group of five universities that work with the Institute, but I believe that, with regard to their work, we are confronting a challenge as we enter into a new era brought about by the implementation of NAFTA. This could be an important incentive to create a national network of academic institutions devoted to questions of environmental and occupational health, which could have an interface, with a counterpart in Canada and another in the United States.

Question

To what extent are there enough trained personnel in occupational and environmental health to staff such an institute or a network of activity, particularly in Mexico? Is the lack of trained people a problem?

Mexican Delegation

Yes, there is a shortage of trained personnel in this field. For the past two years, the Institute has had a Master's degree program in Environmental Health, four people having attained that degree. Normally, those people are sent by the states or by Health Services to acquire that training. Nevertheless, there is not a demand that compares with the need felt in the country. This is why I would think that, in the fields of environmental health and epidemiology, we are far from being able to provide what the country needs now. This gives greater credence to the possibility of a network between the different institutions, as this would enable us to use more effectively the scarce resources available.

With regard to occupational health, this is a program that is not seen in the programs of Mexico's Schools of Medicine, as is the case in Canada. The more recognized specialties are those of Social Security, and perhaps that of the Metropolitan Autonomous (School of Medicine). Almost all Schools of Medicine do not include in their programs medical specialties in the field of occupational health.

With regard to environmental toxicology, there is only one Doctorate program in this field and another in general toxicology. But, in any event, the professional quality of people graduated from those Master's and Doctorate programs is very poor, and this is another area that ought to be strengthened. With respect to Roberto's idea about creating regional centres, probably these could impart courses in occupational health or Master's and Doctorate programs in toxicology.

On the other hand, we live with a problem in the sense that people carry out evaluations from the standpoint of the regulations. These evaluations lack preparation to precisely gather applicable information required for decision-making purposes. In many instances, they limit themselves to gathering operational or safety information, while neglecting data on the intrinsic safety of the plant, for example, whether reactors are appropriate, or if valve types being utilized are correct. These data are related more to the process than to the exposure to danger by the workers and surrounding populations.

Until now, for example, we have trained 27 people for the whole country, 27 people who may, at a given moment, make an evaluation of occupational exposure to health hazards and an evaluation of the type of substances being handled, of the safety with which they are being handled and their probable interactions in order to gather, up to a certain point, information. However, this is evidently not enough for our country, where we estimate that the number of high-risk plants alone is more than 35,000. This shows another important lack of human resources, and these are not as focused on the academic aspect of a Master's degree or an occupational health specialty, but rather on an army of technical workers with a clear definition of the type of information to be gathered and from which could be created a database, even to prepare specialists in the necessary specific fields.

I believe that both things that were mentioned are very important. One, that of structuring this network, and the other, of seeing what role labour unions play here, in order to stimulate, through them, protection at work. Up to now, they have not been used for this purpose. Consequently, by interfacing both things, I believe that this would make protecting the population much more feasible.

Response

I just want to say very briefly, that perhaps the training method carried out on two levels, both the academic and the practical aspects of supervision and control, is one of the specific points that might benefit the three countries. Perhaps establishing training programs at all levels among the three countries would help, on the one hand, to comply with more uniform standards and, on the other, to significantly expand social benefits based on a commercial and trade agreement.

American Delegation

I would like to come back to what Prof. Rantanen had suggested, in terms of putting together information, and offer the US point of view. We have two documents and I can assure you that one has a feeling that they are discussing different things. We have prepared a document on what we see is our cooperation with WHO, and WHO has prepared a document on what they see the cooperation of WHO is with us. I can assure you that the two documents don't have the feeling we are talking about the same thing, which is quite important. We have had a meeting recently where we are now trying to stick together and write a document. This is not a simple exercise. In light of this, I support Prof. Rantanen's suggestion that someone from each of the three countries outline their own situation. Then the three can put something together.

THE AMERICAN SYSTEM

Dr. Christopher Howson, USA

My colleagues will present an overview of the US environmental and occupational health systems and discuss the opportunities presented by NAFTA for enhancing these systems.

Let me put our discussion in a brief perspective, if I may.

NAFTA, which entered into force on January 1 of this year, will create the largest free trade area in the world, with some 370 million populace and an annual gross national product totalling more than 6 trillion dollars. The trade and investment liberalization objectives of NAFTA will affect nearly every aspect of business activity in Mexico, Canada and the United States. Not surprisingly, during the NAFTA debate, trade and environmental and occupational health issues emerged in a controversial manner, with much of the attention in the United States paid to the conflicts between trade and the environmental and occupational health issues. I found this interesting, in view of the fact that the process leading up to the signing of the 1989 US/Canada Free Trade Agreement was marked by very muted concern on the part of the US about environmental and occupational health issues related to the agreement. These concerns were not so muted in Canada. I think this difference between the US posture and the Canadian and Mexican free trade positions is revealing, with respect to the underlying primacy and selfishness of national interest in international cooperative agreements such as these. But there is also a bright side to this. And that is that historical events like NAFTA force self-examination and provide opportunities for change. The environmental and occupational health concerns being debated around NAFTA were not caused by the Agreement. They existed before the Agreement in all three of our countries. What NAFTA offers, I believe, is an opportunity for positive change and that's the focus of this session. This discussion will be somewhat freewheeling, given the nature of the four individuals involved. Basically, Dr. Silbergeld and Dr. Frumkin will set the stage by describing the historical origins and structure of the

environmental and occupational systems in the US. Dr. Rest will discuss the changing workplace and workforce in the US and the implications these have for NAFTA. And Dr. Robbins will end with a discussion of the opportunities that NAFTA presents for improving the environmental and occupational health in our region.

Dr. Howard Frumkin, M.D., Director, Division of Environmental & Occupational Health, Emory School of Public Health, Atlanta, Georgia, USA

I am an internist and occupational health doctor in epidemiology at Emory University in Atlanta. If I am wearing any special hat here today as part of our group, it's as a clinician. I care for patients with environmental and occupational illnesses in a university-based, employer-independent occupational and environmental medicine program. As a teacher, I direct a residency program that trains occupational medicine physicians. I teach medical students at Emory and I teach in a Master's and Public Health Program. My interests are on the clinical side, most recently in lead poisoning and, previous to that, in cancer and occupational lung disease. On the policy side, I have recently been writing about the right-to-know in the US. There is a raging debate on occupational health ethics in our country now, of which I have been a part as well. I am going to give you the road map, the outline of which we will talk about in the next few minutes and then I'll be sitting down and Dr. Silbergeld will pick up with some background material.

We are going to begin very briefly with an introduction to the background and structure of environmental health and occupational health in the US. Dr. Rest will talk about some recent changes in the US workplace. There are large contextual issues. Then we'll march down a long list of problems that we see with environmental and occupational health. Our goal here is to hang out our dirty laundry and to be self-critical in front of you as a way of setting the stage for the next part of our discussion. Finally, Dr. Robbins is going to lead a discussion of opportunities in NAFTA. We all want to be moving toward talking about what we can do as a group of three countries, as a group of about 20 professionals, to advance the cause of occupational and environmental health on the continent.

Dr. Ellen Silbergeld, USA

By way of introducing myself, let me propose this schematic for the overall processes and players in the making of environmental health policy in the US, and there are similarities to occupational health. There are three major players involved: government (at both the state and federal level) and within the government, the three branches of our government, the Congress or Legislative; the Executive, President and the Executive Agency as well as the Office of Management and Budget, which plays a very strong independent role within the Executive; and of course the Judiciary. The private sector or the regulated community, as it refers to itself, is the second major player and the third, which is

where I come from, is the so-called *public interest groups*, which are perhaps somewhat unique, both in their strength and influence and the particular role that has been allocated to them.

So, I introduce myself as a staff scientist with the Environmental Defence Fund, one of the larger of these public interest groups. It was founded in 1972 and its reason for existence was to bring legal action against New York State to halt the spraying of DDT on Long Island. Because of the success of those activities, the people who brought that law suit decided to incorporate themselves and, over the next 20 years, sufficiently metastasized to now have a budget of some \$21 million, five offices around the country, more than 125 staff of engineers, scientists, economists and lawyers, and over 125,000 members in the US and Canada. I am, by training, an Engineer and Toxicologist. I hold an appointment as an Epidemiologist and Toxicologist at the University of Maryland Medical School but I'm here as a member of the public interest community to explain those perspectives to you.

By way of setting the stage, let me provide something of an historically-based perspective on the growth and development of environmental and occupational health policy in the US over this century. The first phase, which occupied the first 50 years of this century, we could call a *first-wave* approach, wherein the goals with respect to environmental policy were directed by a desire to both conserve and preserve natural resources. This was the era of President Theodore Roosevelt, John Muir and others, in which the perception was that the natural heritage of the US was at risk of over-development and over-exploitation. The institutional response to that was creation of the national parks system, additional legislation empowering and authorizing the Department of Interior to both conserve and preserve natural resources and, most specifically, empowerment of the Bureau of Land Management within the Department of Interior. At the same time, the first response to public concern over the very basic safety aspects of foods, drugs and cosmetics resulted in passage of the first food drug and cosmetic acts in the 1920s and '30s and establishment of the Food and Drug Administration. Similarly, largely inspired by activities in the UK and Germany, response to very basic concerns about occupational safety led to establishment of worker compensation systems and creation within the Department of Labour of new initiatives and responsibilities. I note here the Bureau of Labour Statistics and, as many of you know, in the 1930s the creation of the first kind of social safety net through the passage of social security legislation. In general, we have a very interesting and not always easy, balance of authorization and implementation between the federal and state systems in all respects in the US. There are fundamental constitutional provisions, which are in something of conflict. The US constitution provides for federal regulation of issues that affect inter-state commerce, but at the same time, there is a very early statement by the US Supreme Court that those powers not expressly allocated to the federal government are reserved to the states.

The second wave of environmental and occupational health policy was very short but extremely creative. This occurred from 1960 through 1980. This wave responded to concerns related to health and disease. So, going from the primary motive of natural resources, preservation and conservation, we now move to issues of human health and disease as central concerns in environmental health policy. There was considerable attention focused on issues of institutional authority. Prior to this time, you will recall that new mandates and legislation had been largely centred in existing agencies, such as the Department of Interior and the Department of Labour. This 20-year period called for the creation of new agencies and new institutions. The methods that were largely utilized during this period were the creation of laws that mandated legal, enforceable standards and regulations. Now, the products of this period were the new agencies of the Environmental Protection Agency (EPA) and then the occupational agencies.

In addition to the EPA, other new agencies created were the Consumer Products Safety Commission and the Council of Environmental Quality, since declared dead and buried, which was housed within the White House to provide an overall integrated authority in this area. There were two new research initiatives created at this same time. Within the National Institutes of Health of the Department of Health and Human Services, the National Institute of Environmental Health Sciences was created. Out of the National Institutes of Health, the Food and Drug Administration and other authorities, the National Toxicology Program was created to provide scientific information in support of the standards and regulatory forces that were brought into play by new legislation. The EPA supported a large number of new statutes. They covered everything from media-specific issues, such as drinking water, surface waters and air, through particular industrial sectors such as pesticides and industrial chemicals. So that, by the end of this period in 1980, there are some 12 laws, which cover these general areas and certainly provide some of the complexities and issues, which we will discuss later.

Dr. Howard Frumkin, USA

Just to fill you in on the occupational health side of things, mostly a product of the second wave, occupational health in the US is divided between the federal government and state government. Generally, regulation is a federal function and worker compensation is a state function. What are the structures that carry those functions out? On the federal side, we have the Occupational Safety and Health Administration (OSHA). It was created in 1970. In the key period during the second wave of 1960 and 1970, the *Mine Safety and Health Act* of 1969, and the *Occupational Safety and Health Act* of 1970 appeared. The *Mine Safety and Health Act* followed popular recognition of the hazards of mining after a tragedy and strong activism by the mine workers' union. The *Occupational Safety and Health Act* followed activism by a number of industrial unions. That created the Occupational Safety and Health Administration, which is part of the Department of Labour. It's responsible for standards-setting and enforcement in occupational health. And it is worth noting that there was tension between state and federal enforcement at the time. A number of states had existing state agencies to carry

out these functions and, as part of the legal compromise, states that desired to do so were allowed to continue to perform those functions, as long as they met the requirements or exceeded the requirements of ownership. So, about half of our states now have so-called state plans that carry out enforcement on a state level, although, within the context of regulations, the remaining states allow federal offices to do that for them. There is a counterpart Mine Safety and Health Administration, which does similar things for mining.

I mentioned EPA here, although it is primarily an environmental agency. But it has responsibility for the occupational health regulation of pesticides. That's a special category that is reserved for EPA. The fourth institution to mention is the National Institute for Occupational Safety and Health, also created by the *Occupational Safety and Health Act*, formerly directed by Dr. Robbins. That's the research institute. Part of the Department of Health and Human Services does not have regulatory functions at all but serves as an institute for research and recommends standards that, in theory, OSHA then considers and promulgates.

On the state level, the major function to mention is worker compensation. This is actually a legacy of the first wave. Worker compensation laws were passed on a state level during the 1910s, '20s and '30s. Those are the laws that provide insurance coverage both for medical costs and for lost wages for workers who are injured on the job. It works pretty well for injuries, and not so well for occupational illness and that is a major concern of that scheme now.

Of the four major interest groups or players in occupational health, one is business. We have had a very adversarial relationship in the US, unlike what we heard about yesterday in the Nordic countries. Business has often taken an oppositional position with regard to safety and health regulations. In fact, an important point to make about OSHA regulations is that a large number of them were adopted in 1970 when the Agency was formed, but since that time, in the ensuing 25 years or so, there have been very few regulations promulgated. The reason for this is that, invariably, when a regulation is promulgated, it is challenged in court by industry and the process drags on for some years until, finally, there is a resolution. So that business has, at least in some sectors, played a fairly oppositional role to safety and health regulation. That's been more true in recent years as part of the general Thatcher/Reagan anti-regulatory climate prevalent in our country.

Non-governmental organizations have been an important part of the scene. The one that I'll mention specifically is the ACGIH, to which we heard reference yesterday. It recommends a large number of standards. In most cases, these days, those standards are more stringent than those legally on the books by OSHA. But the ACGIH standards do have an important role in our country and elsewhere, as the basis for legal standards.

The third important constituency is labour. With labour and industry on opposite sides of the fence, very often that's the arena in which occupational health and safety policies are forged.

Dr. Ellen Silbergeld, USA

The wave in which we are at present, at least in the US, one could say began roughly in 1980. The goals or concerns of the third wave are, again, somewhat different. There is now a predominant shift away from the notion of standards and regulations and institutions of government as the main means by which to achieve the goals of environmental or occupational health and protection. The move is toward adoption of a new concept, away from the idea of disease and health and environmental pollution, toward a farther-up-the-pipeline concept, that is the notion of pollution prevention. Instruments that are now of great interest, in addition to or supplanting regulation and standards, are the use of information, including labelling, and so-called *market incentives*, rather than a restrictive or adversarial approach to the economic forces extant in the country.

The problems of the third wave, to date, that I would suggest are worthy of consideration — let me note that we do not yet know how effective these products are, because they are very new — include the components of the superfund law, relating specifically to community right-to-know, which is an instrument of information. Similarly, within the hazardous waste area are the Toxins Release Inventory, another information instrument of public policy; the President's Commission on Sustainable Development, which has replaced, to a great extent, the Council of Environmental Quality; and what I would suggest are three very interesting instruments employing these non-regulatory approaches to achieving environmental health. Let me note that a new research agency has been created in the third wave, that is the Agency for Toxic Substances and Disease Registry, which is a component of the Center for Disease Control.

The first of three instruments worthy of our consideration, because of the possibility of their utilization in multilateral approaches to environmental health, is the notion of trading, which is an explicit implementation of market incentives as a way to achieve environmental improvement. In the US at present, the only operating market for trades, and I mean this quite literally, is trade in sulphur dioxide emissions and there is, in fact, an operating market within the US, whereby utilities and others may trade in the right to emit sulphur dioxide under a standard set by the 1990 *Clean Air Act*. But it is a hope that greater efficiencies and speed of achieving certain guidelines can be accomplished by allowing market incentives to play in a regulatory bounded market. An attempt to overcome the culture of adversarial interactions in environmental health has been a greater reliance upon so-called *regulatory negotiation* among the parties of interest. This is an attempt to bring to the table the three parties I mentioned earlier — government, the regulated community of industry and the so-called *public interest groups* — to work out, prior to the promulgation of federal regulation, proposals that would thereby avoid many of the protracted legal discussions because they represent a

consensus position. There has really been very little success in regulatory negotiation. Overcoming a culture of adversarial interaction is a difficult thing to do. But I have been part of, I think, one of the few successful regulatory negotiations that related to the actual implementation of PCB regulation in the US.

Another interesting innovation is the so-called *Proposition 65* in California, which was written by the Environmental Defense Fund. Its notion is use of product labelling in a proactive sense to elicit information from manufacturers of these products and emissions at sites of toxic release as a means by itself to encourage reform of behaviour. It has had something of a mixed success today.

Another aspect that is very important in the US context has to do with the concept of public access to the entire process. It is not a coincidence that environmental and occupational policy-making is played out in an arena of considerable public access, because the second wave, during which many of the institutions and laws that we now work with were created, coincided with a period of intense distrust of the federal government. This is the post-Watergate and post-Vietnam War era. So, at the same time that EPA and OSHA and other institutions were being created, there were a number of new statutes, as well as reinforcements of existing process, that encouraged and, in fact, mandated public access.

I should also note that many of the statutes that EPA enforces were, in fact, written by environmentalists and therefore include very specific avenues for public access, which I'll discuss. Let me remind you that public access means access by all non-governmental parties. That includes the private sector of industry, so-called *public interest groups*, such as my own, and other parties. There are general statutory provisions, which encourage, support and even mandate access by the public to government processes. One of the most important is the *Administrative Procedures Act*, which lays out how regulations are, in fact, to be promulgated by regulatory agencies.

In addition, from my perspective, I cannot overstate the *Freedom of Information Act*, which, in the US, allows almost unlimited access by any member of the public to government documentation. Over the years, in fact, the so-called *national security and confidential business information restrictions* upon the *Freedom of Information Act* have been cut by court decisions. This is a very very broad right enjoyed by all of us. In addition, there is so-called *sunshine legislation*, which applies to state processing, such that state business must be conducted in the open, committee meetings must be public, noted government documents must be available, and so on.

And finally, the general principle in our constitution of judicial review of agency decisions provides yet another possibility for public access. Now, this access can be utilized both in a reactive and proactive mode. In the reactive mode, the public has the right to sue the government if policies are not timely, if policies are not consistent with the statute under which they are issued, if they do not protect general constitutional principles of due process and also if they are not reasonable.

And that is where the whole reasonable basis for regulatory decisions in environmental and occupational policy becomes extremely important, because this is ground upon which any party of interest may sue to have a regulation overturned.

But what has been particularly interesting, and possibly unique to the US experience, has been the ability of the public to initiate regulatory activity in occupational and environmental health. This is an aspect that was written into these laws quite purposely by the public interest community. For example, under the pesticide law, the public may initiate a law suit calling for a rebuttable presumption against registration — essentially the legal process by which a pesticide can be removed from the market. That is under the federal insecticide law administered by EPA. The public can bring a petition to the EPA under Section 21 of the *Toxic Substances Control Act* to get an industrial chemical removed from the market or to restrict its use. The public may bring a petition to the Occupational Safety and Health Administration for an emergency exposure limit and thereby limit use and handling of an agent within the workplace. The public may bring a law suit under the *National Environment Policy Act* demanding an environmental impact statement for a particular activity by the private sector or by government itself in terms of sighting or other activities. On a very much more detailed, but in fact on-balance, even more important level of activity, at the local and state level, the public may intervene and initiate requests for permits under the *Clean Water Act*, the *Clean Air Act* and the *Hazardous Waste Statutes*. Finally, the public may bring a petition asking that a specific site be declared a Superfund or hazardous waste site under the *Hazardous Waste Law*. Now, all of this is not theoretical. All of these powers have, in fact, been used extensively by the public and, in fact, to my knowledge, all the pesticides and industrial chemicals that have been restricted in the US have been done so in response to public petition. This is a very powerful and effective process.

DISCUSSION

Dr. Mauricio Hernández, Mexico

I understand that, under the *Freedom of Information Act*, one can request government-held information. If the government has records of atmospheric emissions or water discharges from all industrial plants, then does that information held by the government refer to all information that might potentially be dangerous with respect to environmental health?

Dr. Ellen Silbergeld, USA

No, it probably does not cover all information, because we do not collect all information. But any information that is required to be collected under statute — for instance, air monitoring, discharge information, concentrations in water — is available through the *Freedom of Information Act*, because it must be made available to government. There are some restrictions under the Pesticides and Toxic Chemicals Actions related to confidential business information as to the amount of information the private sector supplies to government, which is then accessible by the public. But again, over the past 10 years, those restrictions have been reduced by courts upon public challenge. So that, in effect, almost all information collected or sent to government by private parties is available to any member of the public.

American Delegation

It might also be useful to note, with the new law that Dr. Silbergeld referred to, the *Community Right to Know Law*, where the EPA gathers information on air emissions, water emissions, discharges into the soil, transportation of materials off-site for recycling — all of this is now available to the public even without going through the *Freedom of Information Act*.

We have all recognized the continued adversarial relationship in the US. This getting of information, though simple in principle, costs a lot of money for the people who want to get a lot of information. There is a lot of time involved. Use of the Freedom of Information Act, although it is there and on the books, open to everyone, is a major undertaking.

I wanted to mention what I think was the principal source of business antagonism to the early days of OSHA, and it is something that I am not aware exists broadly in other occupational health regimes. That is the right of entry. OSHA, the regulatory agency and National Institutes of Health (NIH), the research agency, could send inspectors and researchers into any American workplace. Although that may not be as intrusive as it sounds, the fact that worker complaints could bring a government inspector into the work site to look at the problem was perceived by employers as a direct intrusion into parts of their world that were under their sole sovereignty. This became the greatest source of antagonism to our *Occupational Safety and Health Act* in the US.

We have two sources of occupational health outcome data. One is worker compensation. Access and quality vary a lot from state to state. There is a federal data collection system run by the Bureau of Labour Statistics. There is a systematic survey of workplaces nationally that's done every year to stratified/random samples. Employers have to report injuries and illnesses, so there may be under-reporting. But the collected data are then tabulated into a report

that is issued publicly every year. That's our second major data source. A lot of the national comparative data base is derived from business, labour and statistics reports, rather than from worker compensation.

**Dr. Kathleen M. Rest, Assistant Professor, Occupational Health,
University of Massachusetts, USA**

I want to speak briefly about some of the major contextual or social changes that are happening in the US that I think affect both occupational and environmental health and have some potential effect on NAFTA. I am from an academic institution, the University of Massachusetts Medical School. I am in an Occupational and Environmental Health Program there. I teach medical students; residents in training, family practitioners and general internists about occupational and environmental health. We have a residency program in occupational medicine. My role there is interesting. I am the only non-physician faculty member in the occupational health program. I see my role as constantly reminding medical students and physicians-in-training that occupational health or medicine are only a very small part of protecting the workers and the public from the effects of occupational and environmental health hazards. My job there is to constantly try to enlarge their vision and their own perceptions of their roles as protectors of worker health and safety. And for those of you who either are physicians or who work with physicians, you know this is a very difficult task. Academic medicine is structured in such a way that it is very narrowly focused on clinical medicine — curative clinical medicine, not even preventive or public health-oriented. So, my job is to look at the larger social policy aspects of occupational health and safety. It's because of this that I have been involved in a lot of research relating to policy issues in occupational health and safety, including, most recently, the interaction of worker compensation and our whole new impetus for health care reform in the US under President Clinton's proposed new health plan. But I am also involved in workplace and community right-to-know, in worker training and education, and in worker involvement. It's because of those interests that I'll speak very briefly on some of the changes that are happening.

When we talk about the changing workplace and the changing workforce in the US, we can talk about both macro-changes and micro-changes. The macro-changes are the changes with which we are all familiar. There has been a decline in our manufacturing sector and our manufacturing jobs. We have fewer and fewer highly skilled blue-collar jobs. And we have seen a growth in the service sector in our country. This means a growth in some white collar jobs, but a very big growth in what we are calling *pink collar jobs*, in the service sector. So these are the macro-changes that are happening.

What I have been interested in, lately, and more and more concerned about are the micro-changes occurring in all of these sectors: manufacturing, service, hospital, transportation, and energy. All of these sectors are going through what has been described as a second industrial revolution in our country. What we're talking about is a restructuring or a re-engineering of the workplace. It's not unusual to

pick up a newspaper or a *Time* magazine or perhaps to turn on the radio and hear people talking about the need to re-engineer our workplace. Mostly, what that means is that we want to make our workplaces more competitive, to have enhanced productivity, and perhaps sometimes people talk about enhancing quality. All of these are the buzz words that are used when we talk about re-engineering the workplace. This contains a lot of opportunity for us. It also contains some concerns, and those are the things that I want to address very briefly.

What I see as the possible and, most likely, probable effects of some of this re-engineering or restructuring of the US workplace is, first of all, downsizing. Corporations talk about becoming lean and mean. Downsizing means increased job loss. It also means that we have a de-skilled workforce in the US. You may pick up magazine articles that say: *No, no, no, what we are doing is multi-skilling. We are building skills in our workforce.* And I say, be careful when you hear that. It may mean that workers are being taught more and more skills, but let me tell you, these skills are not highly valued skills. They do not take a lot of training. Really, we have de-skilled workers doing multiple tasks. So, employers and new consultants in re-engineering may talk about multi-skilling, but what I see is generally a de-skilling of the workforce in the US.

What does this mean for what we are considering today? First, we know, and Professor Rantanen reported on some of it, that there are certainly health effects of unemployment that we need to consider. Second, there are economic and social costs of unemployment. We need to think about the effects of these possible elements of the new workplace on worker health and safety. There has been some very good work done in the Scandinavian countries, looking at the health effects of work organization and worker involvement in organizations on worker health. I think it is something that we, as occupational health professionals, need to be thinking about as we re-engineer and re-structure our workplace. Finally, I am concerned about the implications for all of this on job training and job retraining. It means that we need to think about what kinds of workers we will be needing in the future, what kinds of skills we need to build and we need to be cognizant of the whole focus on retraining our workers who are laid off in this general trend to downsize or to change the work environment.

My question always is: retrain for what? What job? We are losing jobs. Or are we retraining for very low-skilled jobs? The MacDonal'd's jobs. What I hope we can think about in the course of this is the effects of these sorts of micro-changes on jobs and the effect of jobs on worker health and on the environment.

Briefly, on the changing nature of the workforce, I think Dr. Rantanen went through that quite nicely yesterday. In the US, we have an increased number of women workers, and an increased number of older workers. With our new *Americans with Disabilities Act*, we see a new emphasis on trying to employ and retain workers with certain disabilities. We have an influx of immigrant workers who often do not speak English. We have a declining unionized work sector. We

do have a changing workforce and, I add, an increasingly de-skilled workforce. What we are going to do next is go through a series of problems in the hope of being self-critical about what works, and what doesn't work in our system.

Dr. Ellen Silbergeld, USA

Many of these problems arise from what people had hoped would be strengths of our systems. The first one is the quite considerable delay that has, over time, been a feature of reaching decisions in environmental and occupational health. After adoption, in the early 1970s, of a number of standards from ACGIH and other sources, there has been close to a regulatory paralysis in the system. In part, certainly in the environmental area from my perspective, we have inadvertently built into many of our laws and policies, incentives for inaction. Under the *Toxic Substances Control Act*, this statute becomes activated when the EPA has sufficient information for a "reasonable basis to assume an unreasonable risk." There are two thresholds that must be met here. First the reasonable basis, which assumes some quantum of information, consistent with reaching some defensible objective decisions. The second threshold is that that quantum of information must be sufficient to support a suspicion of unreasonable risk. Taken together, this is quite a burden upon the system for information at the beginning.

One of the ways in which this information is supposed to be obtained by EPA is through Section 8E of the *Toxic Substances Control Act*, in which industry or anyone who comes to know of a risk of a particular chemical or situation must report that information to the EPA. What incentive does anyone have to report this information? The only result for the regulated community could be that the ponderous machinery of government might be set in action against them. So that Section 8E, in fact, has become an inadequate way to ensure reporting. The coupling of information-gathering to regulatory machinery can then become a disincentive for even gathering that information.

We are concerned about problems of inconsistencies. The most important inconsistencies are the gross inconsistencies between environmental and occupational standards for the same substances. There are between one and four orders of magnitude difference between ambient air standards and threshold limit values in industry, even between blood lead levels that are acceptable to the general population and blood lead levels that are applicable in industry. Those differences set up very real tensions. There are issues related to what we call *environmental justice, environmental racism*, which has to do with the way in which environmental policies have been implemented, such that certain groups within our population have not enjoyed equal access to environmental protection and, in fact, environmental risks have often been imposed upon communities that bear the burdens of other social and economic disadvantages, particularly racial minorities, African Americans, Hispanics, Native Americans and the poor in general.

Dr. Anthony Robbins, Professor of Public Health, Boston University, USA

I would like to make a similar demographic point on the workforce. We have a large and often-ignored set of marginalized populations or secondary economy — minority workers, a large population of migrant workers, many from Mexico, populations of immigrants not only from Latin America but from other parts of the world who do not speak English. Increasingly, we have an economy that looks a little bit like Japan's in that there are large numbers of marginalized, low-wage, low-skilled subcontracting firms hired by more long-term firms, creating an area in which employment is without benefits, without long-term prospects and often without health and safety protection. A very important sector of our workforce is unreached by our social benefit programs.

American Delegation

I have some numbers as to what has happened vis-à-vis joblessness and earnings. For example, white male high school graduates went from approximately 1.1 per cent joblessness in the 1960s, to a present 4.8 per cent joblessness. Whereas, black high school graduates went from 3.8% joblessness, in the 60s to 21.6% at present. It is worse for black high school dropouts. Earnings at the same time for the four following groups: white (male) high school graduates, white high school dropouts, black high school graduates, black high school dropouts went as follows: First, for the white high school graduates, there was a decline in real earnings of 3.5 per cent, for the dropouts 17 per cent, for the black high school graduates 22 per cent, and for the black high school dropouts a 47 per cent reduction in real earnings. This is part of that picture.

Dr. Ellen Silbergeld, USA

With respect to redesign of the workplace, what we need is a focus by managers on the effects of different work organizations on worker health and safety. For workers, what I think it means is expanding their role and their right in the workplace to not just know about and act on information about health and safety, but to know about and be involved in decisions regarding introduction of technology, alternatives to technology, and safer technology. We need to expand workers' purview in this area.

American Delegation

The next item of self-criticism is the declining union role. The portion of our workforce that is unionized has been declining steadily since WW II. We are down to about 10 per cent of the non-public workforce now. Moreover, the unions' role in occupational safety and health has declined over the last 10 or 20 years, since the second wave. Part of the economic retrenchment that Dr. Rest spoke of has involved a return of US union concerns to more narrowly economic issues, from what was a social agenda during the '70s and early '80s. One of the things that we lack is mandatory labour management committees in workplaces, such as there

are in parts of Europe, though we are currently considering legislation that would require such committees in US workplaces. Vocational education and union apprenticeships in the US are silent for the most part with regard to job safety and health, so that, overall, the organized voice of labour and the training programs offered by labour to new members provide very little room for information and involvement in job safety and health.

On the topic of uni-disciplinary approaches, there has been a lot of discussion about training in capacity building. What we have seen in our country, I think, is a lot of occupational environmental health professionals trying to address the problem but doing it only from the perspective of their own disciplines. We don't see physicians working with nurses, we don't see physicians and nurses working with industrial hygiene people, or environmental health scientists. We don't see them working with engineers, or management. My sense is that we have had a uni-disciplinary approach to solving occupational and environmental health problems. What this means for me as a teacher and trainer, when we think about building capacity and developing training programs, is that we really need to think about multi-disciplinary training programs so that people in all of these disciplines interact and understand how the others can contribute to their own roles. It means having hygienists come into the medical schools to teach about industrial hygiene, and vice versa. It also means that students in schools of management and schools of engineering need to hear from health professionals and industrial hygienists and toxicologists about environmental health and safety. I think, finally, it's a plea for a new vision for all of these professionals to become more public health and prevention-oriented.

I wanted to talk very briefly about source reduction. This has to do more with the direct effect of the workplace on the environment. Historically, in our country, and I think in most other countries, there has been an emphasis on end-of-pipe controls for environmental protection. Very little emphasis has been given to source reduction and to pollution prevention. This is changing, luckily, in our country. But what we need is to find ways to encourage and to provide economic incentives to innovators in industry: people who are willing to innovate their processes or innovate their product in such a way that they will start to control pollution and waste by preventing their generation in the first place. In terms of regulation, this means we need to give serious consideration to technology-forcing regulation and to a regulatory philosophy that takes into account prevention or technology-based standards and not necessarily the endless debate about risk or risk-based standards.

Canadian Delegation

I wanted to make one comment because of something you said, which has a commonality possibly with what's going to happen in Canada. I don't know what the statistics are, but in the last little while, because of the recession, there has

been a major move toward job-sharing and toward multiple people doing single jobs. This has meant, of course, that, in fact, there have been low-or-no-benefit packages, and lower training.

Dr. Anthony Robbins, USA

I am a public health practitioner who started out at McGill University with my first real job doing health services research and went on to be a State Health Commissioner in Vermont and Colorado, following which the unions and the environmentalists got me hired in the Carter Administration to run the National Institute of Occupational Safety and Health (NIOSH). That lasted until President Reagan was elected and, a few days later, I was out on the street, briefly unemployed, and ended up spending five years working for the Energy and Commerce Committee, the principal health legislating committee in the House of Representatives. So I have seen a little bit of the legislative stuff from the inside. After a stint at Boston University, I am back running vaccines and immunization projects in the Department of Health and Human Services.

I mentioned unemployment: in all three of our countries — and it's certainly true in Europe — it's part of the picture. But unemployment, at least in the US and, to a lesser extent, I believe, in Canada and Mexico, leads to tremendous inequalities in wealth and opportunity. If you look at the industrial climate around the world, the economists talk about factor pricing. With the kind of transportation and, particularly, the kind of communication that exists, it has become easy for large industries to go anywhere in the world to buy particular pieces of their final product and especially when it is largely intellectual property. This results in tremendous pressure from Free Trade. There is nothing in NAFTA that wasn't happening already among our three countries. NAFTA is a very useful and convenient excuse to do what we have been doing for a long time. Two things need to be brought back into this discussion: the real situation of the environment and of workers in our respective countries. All of us, and I include our group, have described the problems in terms of systems, and not exactly what's happening to workers or what's happening to the environment. We need to come back to that. Similarly, I believe we need to take a look at what's happening to the economy where NAFTA fits in. One of the important things to look at in NAFTA is facilitating, among our three countries transnational capital flow. If that is an important feature, what does that mean? The important thing that comes from transnational capital flow will be new investments in our country. For a long time, occupational health people and environmental people have known that new investments provide an ideal opportunity for regulation and for improvement.

The struggles we have all fought to get plans retrofitted either to reduce pollution or to protect workers are, if not totally eliminated, largely eliminated when pull from the profits for new investment is occurring. That's an opportunity for all of us. We need to look carefully at what is going to happen to our free economies in order to know where the new investment is going and to be able to take full

advantage of that investment in order to implement what I think we can all agree on. I learned some of this from what the Nordic countries were doing a long time ago. New source controls are amazingly effective.

Similarly, whenever you have an industrial process, if you can take a look early on, and substitute one process or one material for another, there are great opportunities for environment and worker protection. I would urge special caution for the Mexicans, to be sure, as capital flows into your country, of what kind of technology you are getting in this deal. Are you getting the cast-offs from the more highly industrialized countries to the north, or are you getting technology that is capable of being competitive in world markets for a longer run?

Finally, with free trade, it would be nice to think that standards and harmonization are going to lead to improving the situation, improving the standards in all of our countries. I am afraid I look at these efforts as largely ones of holding the ground in the US and it is only at the global level that these kinds of activities represent a real improvement. In the US, I hope that some of the experience from Europe and Canada will help us hold the line against what is going to be tremendous pressure to deregulate, to lower standards in order to be able to compete.

EXPERIENCE WITH HARMONIZATION OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH SYSTEMS IN THE EUROPEAN UNION

Dr. Alexandre Berlin, Advisor, Health and Safety Directorate, European Commission, Luxembourg

I have been a civil servant in the Community for 31 years. I worked with health physics in radiation protection, and afterwards with safety at work, with health at work, and with public health. Now, I am Adviser to the Director of International Relations in Eastern Europe. As I understood yesterday, the Commission on Environmental Cooperation was established in Montreal and one on Health and Safety at Work is in Dallas, Texas. My reason for mentioning this is that I was reading one of the papers from New Zealand, which describes in a few words what a commission is supposed to do. I think this is relevant to our discussions because I guess the Commission on Occupational Health and Safety is similar, that is to facilitate cooperation and research on problems concerning trade and the environment. The Commission may develop recommendations on issues such as process standards and common emissions limits for certain pollutants. The words *may* and *recommendation* are important, because this sets the limits of what NAFTA can do. At the same time, it establishes the major difference between what NAFTA is about and what the European Union is about. The reference point in disputes or actions in NAFTA is a national law, whereas in the Community or in the European Union, the reference is community law.

This has one major impact. National laws can be changed by national government, by parliaments or otherwise. Community laws are much more difficult to change. They are just as difficult to change as they are to create. This results in a much less seesaw approach. With a change in government, the laws can change if the parliament so wishes. In the Community, in terms of setting community law, because it is not union law, you require, for most decisions in certain areas, unanimity of member states. But also, to change laws, you require unanimity and that's why it is much more difficult to change. In other areas, you require the so-called qualified majority of member states, which basically now means that two of the large countries plus one of the small ones can block. It's complicated waiting for countries and the whole issue in the accession of the four new countries — Sweden, Finland, Norway and Austria — was whether the blocking minority would be changed. Would one require two big countries plus two small ones or just retain the same old system? And, as you know, two countries, Britain and Spain, were very much opposed to increasing the blocking minority, though for totally different reasons. But apparently, they seem to have finally resolved it: the blocking minority will increase, except that certain issues will remain the same. But now let me try to come at least to what I was going to talk about, which is how the European Union was built. It was a very progressive, lengthy, stepwise approach. It really took a long, long time to reach where we are. You have to remember that the first elements of the community as it is now date from 1952, which was the Coal and Steel Community. Very soon thereafter was established a Mines Safety Committee following the big accident in the coal mine in Belgium in 1957. So, in fact, the equivalent of the tripartite Mine and Safety Commission at the community level dates from 1957. This was followed by the economic community treaties and the atomic energy community treaties of 1957 and it's only really in the atomic energy treaty that environmental health, worker health, and probably, health in general were taken fully into account.

There is a whole chapter on radiation protection in the Coal and Steel Treaty, which caused the setting of common standards for radiation levels for the general public, emission standards, and also standards for the workers. At the same time, there is a mechanism of controls. Specifically, for plutonium and other controls, there is a core of inspectors in the Community, which nowadays functions in a very complicated way, in parallel and jointly with the core of inspectors of the agency in general. They go together. We don't trust the ones from Vienna. They don't trust us. So they go together. There are about 200-and-up community inspectors just in the nuclear field.

Then later on, in 1967, there was a basic joining of the executive agencies of the three communities because each of the communities was run separately until 1967. The Commission of the European Communities — and that is the reason why it has a plural — is the executive agency for the three treaties. Finally, in 1987, the treaties were amended to create the so-called European Single Act — one treaty. By extending the competency of the Community and introducing new obligations, it introduced at least two new areas where the Community was

competent — environmental, and health and safety at work. Lastly, in 1993, the Treaty on European Union was an additional step toward a closer union in a number of ways. For example, it introduced additional institutions.

The main institutions of the community are the Court of Justice, the European Commission, the Council of Ministers, the European Parliament, the Economic and Social Committee and the Court of Auditors. The latter is very important to ensure that the member states transfer the funds they collect for the Community to the Community, because all the customs duties that member states collect are not for themselves, but for the Community. One has to go and audit all the harbours, all the airports, all the entry ports in the Community to be sure that the money is transferred to the right place. That is the function of the Court of Auditors. In 1993 was added a Committee of Regions, because there was a problem related to what you have been discussing, which is: how does one involve, as much as possible, the public and the smaller groups — let's say not at the national level but at the lower levels? For that purpose, a committee of all the regions of the Community has been set up. One could imagine a similar situation. The twelve provinces, plus territories in Canada, 50 states in the US and the 32+ regions in Mexico would be part of a committee of regions. So that, in fact, other views than just those of the national authorities can be expressed, as well as views other than those of political parties. The European Parliament is, finally, a political party. Perhaps it is good to state again that the European Union is much more than just a simple market for goods and services. It is also the free movement of workers, which existed already for a long time and is now to be followed, we hope very soon, in a practical way, by the total free movement of people.

The treaty last year also established something I think is unique and that's why it is difficult to compare it with another system. It has established a European Union citizenship, and this will be first expressed on the 12th of June this year at the forthcoming elections of the European Parliament, which are direct, simultaneous elections in the 12 countries. It provides that any citizen of the Union residing anywhere in the Union can vote locally in that country for the election of members of the European Parliament from that country. Obviously, in practice, it doesn't really amount to much, except in a country like Luxembourg, where I live, where 35 per cent of the inhabitants are citizens of member states of the Union. All of a sudden the voting roll will increase tremendously in Luxembourg in the forthcoming elections and it's rather interesting because in Luxembourg the national elections and the European Parliament elections take place on the same day. So people vote for the National Assembly at the same time. It will be very interesting to see, because they want to measure immediately the impact of the citizens from the other countries. This shows you how much beyond the single market the Community goes.

The main theme seems to be chemicals. There has been extensive legislation in the Community, from practically the very beginning, on chemicals. The major purpose of it was certainly not to protect environment or workers, but to ensure free movement of goods. You have to realize that the Commission is totally

independent: the Council of Ministers, Court of Justice, Parliament and so on. The only relation that there is between the Commission and the Parliament for example, is that Parliament can have a vote of no confidence to the Commission, which has to resign if there is such a vote. The Council of Ministers, consisting of the 12 ministers of foreign affairs, soon to be 16, a so-called *general council*, at the same time, meets for each specific topic. For example, Ministers of the Environment now meet usually four to six times a year. For health and safety at work, Ministers of Labour meet between four and six times a year. On health matters, it is the Ministers of Health, and now that health is part of the treaty, they will be meeting more frequently. But up to now, they have been meeting two to three times a year. The Commission, which has 17 members, two from each of the large countries, and one from each of the small countries, are jointly appointed by the 12 countries for a period normally of four years — though that is supposed to be extended to five years — if they finally agree on how to proceed. They cannot be removed by the country that appointed them. The European Parliament is elected by universal vote. The members of Parliament don't sit together by countries, but by parties. For the moment, the largest party, I think, is the Socialist Party. There is a slight center-left majority. In all the countries, they are elected by proportionate presentation, except in Britain. That is true where the trade unions and the economic interests are represented.

Now, what are the various roles? The role of the Commission is to ensure that the treaties are applied. It has another major role, which is the sole right of initiative to propose new things within the treaties. That is fundamental. The 17 Commissioners are assisted by the whole administration of the Commission and I am one of the Civil Servants of the Commission administration, which has 23 general directorates and about 20,000 civil servants. It's a big administration, though not for 370 million people. Whenever we draft a proposal, we assist as technical services of the Commission. Before the proposal leaves the Commission to go to the Council of Ministers, it has to be approved by the Commission, either in written or oral procedure. That's why it is important to realize that the whole political spectrum is represented in the Commission. It goes to the Council of Ministers, if the treaty says, and that's why the treaty elements are fundamental, because the treaty says which of the three steps have to be taken: if the Parliament is just consulted for an opinion, if it is a cooperation procedure between the Parliament or if its a co-decision procedure. If it's a co-decision, a Council of Ministers of the Parliament has to come to an agreement. Why was it introduced? It was basically to try to have a somewhat more democratic approach by full participation of the Parliament in the decision-making procedures at the Community level. It's important and has obviously complicated matters tremendously to arrive at a decision.

Do I need to say more? Perhaps I should explain why I chose chemicals as a topic, which I think is relevant in terms of trade. The chemical industry and the Community represent 28 per cent of the world chemical production. It's about \$400 billion CAD turnover. It's the third-largest manufactured commodity in

the Community. There are more than 9,000 companies and around two to three million workers involved. To answer a question from the floor, what is the relation between the Community and the Union?

The Union is more than the Community. The Union also has the political cooperation between member states, for example, on foreign affairs, justice and a few other things, which are not part of the Community treaties. The whole discussion on police cooperation, justice cooperation, foreign affairs cooperation and, eventually, defence cooperation is not integrally part of the treaty. What is also just as important is the chemical trade. Trade between the member states of the community is over \$100 billion CAD. Exports of the community in chemicals are more than \$70 billion CAD and imports around \$40 billion CAD. So, there is a positive balance. Therefore, you can imagine that it was a key element to try to regulate everything to remove all the technical barriers to trade between member states and that was really the basis for much of the early legislation regarding chemicals. What are the key articles of the treaty governing the way legislation is being established? Relevant to the environment, public health, and occupational health and safety, there are about six or seven articles. The fundamental one is free circulation of goods. There has to be a high level of protection ensured for that free circulation. We had to define the trade area because the Community, the internal market, includes areas without borders, within which the free movement of goods, services and capital are guaranteed. A Council, on the basis of qualified majority and in cooperation with European Parliament, and after consultation with the economic and social community, puts in place all the measures to ensure establishment and functioning of the internal market. That's the beginning.

What it also says is, and this is one of the key points in terms of health and safety, that the Commission, in the proposals that it makes to the Council in the Parliament regarding safety, health and protection of the environment and protection of consumers, must take as a basis for its proposal, a *high level* of protection. On the other hand, health and safety at work are exactly the opposite. Why make things simple if there is a more complicated way of doing it? The Council, on the basis of the proposals of the Commission and so on and so forth, establishes, through directives, *minimal* prescriptions to be applied progressively, taking into account the situations existing in the member states. And at the same time, the directives established do not form an obstacle to member states in fact having stronger measures. The reason for this big difference in the two articles is very simple. One — vis-à-vis the environment and consumers — has to safeguard the free movement of goods, by ensuring that one member state does not introduce additional obstacles. For example, the situation in California of introducing additional labelling requirements would be totally contrary to the treaty. One would not be able to function. And that is why one has to be certain that the level at which goods can circulate does ensure a reasonably high standard of health and safety.

However, for the workplace it's a different thing. If a country wants to penalize itself and have the strongest and most expensive health and safety legislation, it

does not impede movement of goods between countries. And that's where the Commission acts as a watchdog to ensure that whatever is introduced does not have, as a secondary aim, technical barriers to trade. We had one such example a few years ago in Denmark, where very severe requirements for cranes to be used in the construction industry were introduced. We realized the only company that could comply with these was a Danish company. So it was obviously not a measure for the purpose of ensuring adequate safety at the workplace but to promote that company! With respect to public health, we deal with the major scourges of humanity, including drug addiction. We are supposed to be favouring research, information and education. Public health is also to be taken into account as a component of the other Community policies. As a result, we established immediately an intra-service group of all the general directorates chaired by our Director of Public Health to have a forum to see to what extent public policies in the other areas of community action are relevant. It has already had one immediate effect, wherein one of our directorates had a proposal for doing a financial preliminary study from one country in Eastern Europe to establish a cigarette plant. And on the basis of that, they decided not to finance. Unfortunately, in the field of public health we cannot make regulations. It's the only area where we have to work through recommendations and resolution and not regulations because, in fact, the Community foresees that there are basically three types of compulsory laws — decisions, regulations and directives.

In the field of environment and health and safety at work, we have only directives. Directives establish the goals to be achieved but not the means by which to achieve them. That is left to member states. In relation to what we have been discussing, for example, about occupational health and safety on the one hand and environmental health on the other — whether you put the services together or you keep them separate — if you keep inspection separate from labour inspection, this is of no concern to the Community. It's up to the member states to decide how to best organize themselves to achieve the objectives set. There are very few, but there are some chemicals that are prohibited, other than for research purposes. Specific authorization, notification, classification, together with labelling and obligation of information — the WHMIS-type of thing — has existed since 1967, and the setting of limits, air quality standards, emission limits in public and at the workplace are all concerns.

With respect to classification and labelling, the first Community directive in this field dates from 1967, when the first 600 or so substances were classified and the uniform Community label assigned to them. The objective was that there be a unique classification of substances in terms of toxicity, flammability, explosivity, and danger to the environment. There is only one classification system, and only one labelling system, so that you don't have to relabel when you go into another country, but you simply change the language. There is not the possibility for one country to decide it wants stronger labels. Symbols are already uniform throughout the community and throughout the economic free area. There have been a number of modifications to that piece of legislation since 1967, seven different amendments. Probably the most important one, which relates to OECD,

the so-called sixth amendment to the directive, introduces the concept of testing requirements for new chemicals. Lists of all existing chemicals in the Community were made and everything that was not on the list was considered a new chemical. Any new chemical had to have testing requirements. It's on that basis, essentially, that the OECD developed its minimum data set. It existed already for about 10 years in the community before it was developed at OECD. The manufacturer-produced data from one country is transmitted to the authorities of the other 11 countries. If there is no disagreement on the basis of that data, the manufacturer proposes a label. Otherwise, the Commission looks at the differences. What is also important is that it's not a random system. Carcinogens must be labelled a certain way, depending on whether it's category one, two or three of carcinogens, and there are some labels that are more important than others. There are also risk phrases and safety phrases and these are standard. You cannot introduce new ideas except as a community, but no country can put its own ideas on the label. As a result, it is extremely simple to produce labels in all the languages. Labels have to have the name of the manufacturer, the symbols, the characteristics harmful by inhalation and the safety phrases. The information must be kept relatively simple so that it is easily understood and so that it serves to protect the user and not the manufacturer.

We had, in addition, the problem of chemical preparations. *Preparation* is, by definition in the Community, a mixture or solution composed of two or more substances. The basic idea with the preparations was to either test or apply conventional calculation measurements, unless one had a very good reason why that should not be done. Obviously, one had to have a mechanical approach for classification and labelling, otherwise it would become a totally unworkable situation. The Community was not going to label preparations. They had to be labelled by the manufacturer, according to a very simple standardized method. Whether it was scientifically valid or not is almost irrelevant. It had to be a simple method. For example, if there is a carcinogenic substance that has been classified as a carcinogen in the previous set — now there are about 60 or 70 — and if its concentration exceeds .1 per cent, then the label *carcinogen* has to appear. If it's a sensitizer with more than 1 per cent in the composition, *sensitization* has to appear. More recently, we have tried to introduce eco-labelling, to promote basically nice compounds. There is a very complicated mechanism for applying the eco-label.

One of the things that you have been discussing is how to integrate environmental and occupational health and safety. We produced, in 1982, the prevention of major accidents hazards. A major accident hazard is defined as an occurrence of a major emission, fire, explosion, etc., involving development of an industrial activity. The main point of this is that it involves a number of very toxic, flammable and explosive substances. If there are quantities of a given magnitude in a workplace — and some are very low — that workplace notifies the authorities that it is a potential site of major accident hazard. Is there a follow-up by the authorities that the industry has actually complied with that environment? Yes and no. There is a requirement that all these industrial activities notify the authorities when there are

inspections at the workplaces. It is one of the things that labour inspectors look at. So it's not a very systematic mechanism, but there is a mechanism. And what happens is that, at the same time, these workplaces must do several things: a hazard evaluation assessment, risk assessment, emergency workplan inside the undertaking, instruction of workers, training workers for that purpose, outside emergency plan with the local authorities, information to the authorities and the public, including names of the company, that the site is subject to the regulations, what activities are taking place there, the names of the substances involved, the risks of major accidents, how the population will be warned and kept informed if there is an accident, what action the population should take, what arrangements have been made at the site with the emergency services, what off-site emergency plan has been established, etc., etc. It's one of the few areas where there is an obligation to provide information to the public. I thought it was interesting because it's the only one where I can see the inside and the outside combined in one piece of legislation.

I will try to show you how we are structured within the Commission for environmental matters. The Environment Directorate is a directorate that has about 200 people and it has three directorates within it: nuclear safety industry and environmental and civil protection; environmental quality and natural resources; and environmental instruments and international affairs. Maybe the biggest difference between the Community and an agreement such as NAFTA is that the Community has a very large budget to function as a community. This year's budget is about \$100 billion (CAD). It's public money and it has to be managed properly. Awareness in subsidies receives 7 million; radiation protection: 1 million; European Environmental Agency: 8 million; a financial instrument for the environment to promote environmental action: 95 million; civil protection: 2 million; the community research centre: 10 million; research and development — because there is a different budget for community research and development — which is about 1 or 2 billion dollars, out of which 95 million is to be devoted to environment; and then there are the subsidies to central and eastern Europe and to developing countries. In addition, there is, for the external aspects of environmental policy, an additional 5 million for promoting environmental actions in third-world countries outside the community and there is 4.2 million for contributions to international agencies. There is a budget for global environmental facility.

An environmental agency was established in Copenhagen in 1991. It took a long time before countries could agree on a home for it and the home was established in November of 1993 in Copenhagen. It is an information system to provide to member states and the Community preliminary information for developing legislation, and then to follow up — not to evaluate legislation — to see whether the legislation has an impact. With respect to health and safety at work, what we tried to do in 1992 was to have a European Year on Health and Safety at Work. It had a reasonably substantial budget for developing actions in the 12 member states to stimulate and promote activities: \$15 or \$16 million. Then, in that context, we did a so-called *European Public Opinion Survey*. These public opinion

surveys are quite interesting because they are conducted every six months throughout all the member states, by the Community, not by the member states. Through personal interviews of 1000 to 2000 in each of the member states, a series of basically standard questions are asked. What do people think of the Community? In addition, we can piggy-back and ask anything we want. There is a difference in size of survey undertakings between the member states. What was the concern of the people in these surveys? Close to half of the workers felt that their work might affect their health and 40 per cent felt they might have an accident. A quarter felt that they were using dangerous equipment. The majority felt that there were risks of accidents and occupational diseases and 14 per cent had, in fact, had experience of an accident and occupational disease for which they were compensated. What is interesting is to see whether they always or often use dangerous equipment, from 11 per cent in Germany to 26 per cent in Greece. So there is quite a significant difference. You can see it also in relation to type of industrial activity. Even in financing, people felt they were using dangerous equipment. I wonder if money is so dangerous to handle. What is important also is that two-thirds felt that it's the employer who bears responsibility for prevention. Finally, there was a feeling by the vast majority that things have improved. So, at least we felt we were going more or less in the right direction and what was really the most satisfying for us was that almost everybody was in favour of Community legislation. Two-thirds felt that application of Community legislation would improve their health conditions.

Two words on what are the main principles of health and safety at work legislation. We have a framework piece of legislation that sets the requirements for employers: they have to assess the workplace risks, to have competent personnel: there has to be a balanced participation between workers and employers in the decision-making process. There was opposition from a number of countries to the idea of balanced participation, in both directions. Germany insisted on having good balance and other countries insisted on having none. So we arrived at a balance. Workers have the right to know the risk and to remove themselves from danger, which does not mean that they stop working. Employers were very much opposed to it because they equated it with going on strike. In the International Labour Organization (ILO) Convention, it's not the right to refuse to work but the right to remove yourself from danger.

Workers can move from one country to another country. An employer can go with its workers to another country and work, which requires that all the safety signs of the workplace be identical. Everything had to be introduced in a very standard way so as not to create potential misunderstanding when going from one country to another. This even included how you make signs with your hands.

As you have heard, in the next year or so we look forward to four new member countries, two of which are now members of the European Free Trade Associations. In addition, we have agreements with a number of countries of central and eastern Europe and the former USSR. These so-called *association agreements* are formal treaties that include health and safety at work, public health

and environment. One of the objectives is to, little by little, come closer to the Community legislation. For example, Romania has singled out health and safety at work as one of its concerns and has asked for assistance of 6 million (CAD) dollars from the Community over two-and-a-half years. In health and safety at work, we have had, since 1974, a Tripartite Advisory Committee to the Commission, composed of including governments, trade unions and employers. This Committee, in addition to the one on health and safety in mines, includes two government, two employer and two trade union representatives from each of the member states with 72 members, which will now increase to 96 members, plus their alternates. They meet about four times a year and have *ad hoc* committees on a number of topics.

For example, recently they established an *ad hoc* committee on alcohol and drugs at work. These *ad hoc* committees meet between 40 and 50 times year. There is a permanent secretariat to the Tripartite Advisory Committee. That Committee also looks at all draft proposals of Community legislation, even outside health and safety at work, which might have an impact on health and safety at work together.

DISCUSSION

Mexican Delegation

Probably, within the European Community, there were different standards and different levels of progress in environmental and occupational health throughout the various countries. For example, yesterday some data were presented about Portugal, where we saw that Portugal's record in occupational health is not on a level with other European countries. What type of discussions were held between countries such as Portugal and those with more developed standards? Were less advanced countries given extra time to upgrade their standards in order to comply with regulations?

Dr. Alexandre Berlin, Luxembourg

That happened several times. There were cases in which some countries had more difficulty than others in complying with the regulations. On the other hand, there are two help funds, namely the Regional Fund and the Social Fund. These two funds help with training and functions of, for example, health and safety institutes. The Regional Fund has an annual budget, which I think amounts to 3 million dollars, and the Social Fund has \$1.5. This is why there are legal instruments to provide one type of help, and financial instruments to provide another type of help. It is a dual function, with which a fair amount of help is provided. The Regional Fund, in particular, is for the benefit of the less developed countries of the Community.

Dr. Howard Frumkin, USA

I wanted to comment on one of the contrasts between Europe and North America. In Europe, national conscientiousness survives, but there is a continent-wide thinking as well. There are continent-wide bureaucracies, continent-wide regulations that are so complex you can hardly understand them. We are still very much in a nation-based mode of thinking here. In effect, our meeting for the last day and a half has consisted of presentations by three national teams. I want to suggest that we take a lesson from Europe in thinking in terms of continent-wide activities. We should think of ourselves in this room as director general number five or the Health and Safety Directorate or the North American Committee to Advance Environmental and Occupational Health.

There are some mechanisms in NAFTA that begin to move in that direction. For example, the Labour Commission suggests it should be promoting seminars, training sessions, joint research projects, but, in reality, this is a dispute resolution mechanism. There is very little development of this Commission other than in its dispute resolution role. That continues to promulgate the country-by-country thinking. There is not really much continent-wide thinking in this process. I think it's important to change, because if we are going to use NAFTA as a way to advance environmental and occupational health in all three countries, to develop new technologies, to develop new approaches to production, we need to think about it collectively.

Dr. Alexandre Berlin, Luxembourg

Forty years after the Community started, the area of environment is reasonably well off, health and safety not so well off, but that is really a very minute part of the Community budget. It is, nevertheless, the only leverage that we have for doing a little bit more. We were extremely fortunate with the European Parliament because the Community budget is proposed by the Commission and reviewed by the Council but adopted by Parliament and the Parliament has a say on a small portion of the budget, around 10 per cent, where it can change the budget allocations from what the Council of Ministers has agreed. For example, the Life Fund was an idea of the Parliament. The Council was totally opposed. So, in these fields that are relatively marginal in the Community, a coalition between the Commission and the Parliament is quite effective in trying to promote things against the basic wishes of the majority of the countries.

Mexican Delegation

My comment is similar to that of Dr. Frumkin, with the difference that I speak from the Mexico standpoint. As far as I can remember, and the history of the European Economic Community so indicates, the countries that had more difficulty integrating themselves were Spain and Portugal, and because of their economic situation and their socio-economic problems, these were the poorest of Europe. As far as integration is concerned, the European Community is a history of successes, but how many years ago was it established? And we here are dealing with a

treaty among two countries who consider themselves perfect, and another country, Mexico, as yet imperfect that has to copy everything from the United States and Canada. Well, this is the meaning of negotiation. To think collectively, the first thing we have to do is to apply reciprocity in our mutual acceptance, and I believe that this is the great example Europe has provided. This acceptance is being shown right, left and centre, despite all nationalism, which perhaps is much stronger and more pronounced than in America. There is a collective acceptance. I was particularly impressed with the presentation made by the United States, because this is the first time I have seen an academic group practice self-criticism.

Dr. Alexandre Berlin, Luxembourg

The International Program on Chemical Safety produces chemical safety guides. They do this jointly with some money from EC. Safety phrases are translated simultaneously into 50 languages, and therefore are all available in Spanish. There are material safety data cards. They may be a useful tool because they are peer-reviewed by an international committee, which is the one thing that makes them different from any of the MSDS that are produced for chemicals. We have been asked which country we use as a model in making legislation. First of all, it's not answerable! But what is much more important is that, because of the complexity of what we try to put together, one can say that every single country has some difficulties in putting legislation into place. Even the most advanced countries have, in one place or another, problems of compliance. One thing that you might wish to consider is what we established informally, about 10 years ago, that is, a group of senior labour inspectors in the community for two purposes. First, to exchange visits between labour inspectors so that they will spend a month or so in another country and go with labour inspectors of the other country to visit the places and to try to see how they operate, not on a paper scale but how they operate effectively. The second purpose was to exchange views on problem areas. Another thing we did was to develop four or five model situations, which each inspector evaluated separately and independently, followed by discussion on the most productive way to develop a common philosophy. Each of the 12 inspectors from the 12 countries was supposed to make an assessment. Is the situation serious? Should they be given some time to improve? On what legal basis and how? We could make these models available to you. But it is something that we found very valuable as a common means of assessing problems.

Question

I should like to know, with regard to the general negotiation process, what happened with the following points:

To determine language, or how the different languages were integrated as far as labels are concerned, what was mainly considered, country of destination, or country of origin?

In the case of substances that are handled, provision of information for prior consent in order that they be accepted into the country of destination, in view of your experience with European countries, when none of the countries complied with this obligation, what measures were adopted? Did the prior consent list disappear, or was it strengthened?

You spoke of nitrogen oxide emissions throughout all Europe. We find that, in places such as London or Germany, especially in the centre, there are much greater concentrations of emissions. The criteria whereby this norm was chosen, consisted in imposing more restrictive limits in order to protect those with lower emissions from contamination. Or was it the other way around? In other words, was it a question of giving production freedom and letting every country seek its own balance?

Finally, in the case of borders, we all know that particular problems appear, because countries now have a local authorization to trade internally and another supranational authorization to trade internationally. What type of problems were experienced and how have these been resolved? For example, at the border between Spain and France?

Dr. Alexandre Berlin, Luxembourg

To begin, let me give you an answer to your last question. There are now no border controls between Spain and France, no customs controls between the two countries. For intra-Community trade, there is only one system.

As far as languages are concerned, each country uses its own language for labelling purposes. There is a standard phrase system. In all languages, there are exactly the same phrases and no others are allowed.

About trade within the Community and other countries, there are, for certain substances, agreements between the Community and those other countries about prior permission, if those countries so wish. The Community may not impose it. That depends upon the importing country with regard to the conditions it wishes to impose.

Question

Many of us look at the EC with envy because it is a full approach, as opposed to just a trade agreement. We wonder, will NAFTA evolve into a situation like EC or is it philosophically quite different? A second question: with respect to the Danish crane scenario, had a study been done, for instance, showing that there really was a safety advantage to using the crane that they proposed? If the motivation for it wasn't one of giving an economic advantage to their own company but that indeed there was a safety advantage to it, would you have looked at it differently?

Dr. Alexandre Berlin, Luxembourg

I have been with the Community since 1964. I have the feeling that, even from the very beginning when it was essentially a trade agreement, it was a more integrated trade agreement than was NAFTA. The free movement of people is the main difference, and this has created the greatest difficulties. The free movement of people implies a practical, very substantial technical problems. For example, visa requirements have to be identical between countries. Also, if somebody is undesirable he/she can enter another country. So it requires that there be a unique list of who isn't desirable. As a result, the customs officials at the point of entry in the Community have to have immediate access to a central computer list of all undesirables. And it has to have a very rapid response, because customs officials or immigration officials cannot wait for 15 minutes until the computer thinks it over and spits out an answer. They've set a requirement that it must answer within three seconds. For the moment, they haven't managed to put together the program and this is delaying its implementation. Free movement of people makes it a totally different entity with a totally different philosophy.

With respect to the technical assessment of the Danish crane from the safety point of view, we didn't have to go to court, because they gave in beforehand. But we had another example that had to go to court and that relates to a current issue between the US and Canada and between provinces. We had a problem with German beer. There is a very old German law, three hundred or four hundred years old, which prevented addition of additives to stabilize beer. This was on health grounds. Obviously, by not having stabilizers, you practically ban the import of any other beers in Germany, because there is no way they can travel. So this was taken to court and ended up in the European Court of Justice, which finally obliged Germany to strike down its law because there was no health ground for prohibiting addition of these additives. In the Middle Ages, when the law was introduced, medical science was certainly not advanced enough to make that assessment. Tomorrow, there is a special meeting of the Health Council because Germany is trying to restrict the import of meat and cattle from England.

Question

Could you give us a little more information about the mechanism for and the experience with public participation in Community-wide decision-making? Also, does the Commission have people from other countries lobbying for their country's position, or from the constituencies, such as labour and industry?

Dr. Alexandre Berlin, Luxembourg

Your first question is difficult because it's one of the questions that led to the new policy of "the community of more transparency." Because, in fact, there was a feeling of democratic deficit. The different referenda that took place in the various countries for the ratification of the new treaty on European Union showed that there was a deficit in democracy. The mechanisms available for public

participation are very few. I can think of a few areas where they exist in an institutionalized way. In consumer policy, for example, they have a consumer council where public views are represented. Trade unions are represented in our Advisory Committees. You might say that the Economic and Social Committee is in fact an emanation of the public opinion of various interest groups. You have the European Parliament, so you can always go and see your Member. There is a system of petitions to the European Parliament. Any citizen can send a petition to the Parliament and the Parliament will have to examine it and issue a report. The Commission is asked to give its opinion. Members of Parliament can ask written and oral questions to the Commission and I can assure you they ask a lot — thousands a year. They are introduced on the basis of the British model of Question Time in Parliament. But there is still felt the need for more participation. We are trying to develop a mechanism for broader consultation. As for lobbyists, yes, they do exist. There are lobbies from countries, from regions, from industry, from everywhere. There are 100 organizations in Brussels whose main task is that.

Prof. Jorma Rantanen, Finland

It would be interesting for you to hear a little bit about the Finnish experience. We have just passed the negotiations within the Nordic countries and the Community on joining the Union, as of the first of January next year. We have been a member for one year of the European economic area, which means that we have already adopted our legislation with all the European directives. First, it was a question of whether it would be difficult for us. It was extremely easy, because the Nordic level of occupational health and safety has been a little bit higher than in central Europe and there was a lot of concern as to whether we had to lower our level of safety. But, thanks to this marvellous innovation of minimum directives, which permits us to exceed the level, that didn't cause any great problems. To be fair, I have to say that, in some areas, our level of safety improved when we faithfully examined the directives.

But there were also some drawbacks. First, the removal of centralized inspection or quality of consumer production of, for instance, tools. It makes our earlier system much weaker because now Italians have exported to Finland electrical appliances for household uses and Finnish electricity inspection refuses to take about 50 per cent of them. Because of trade, the only way to remove them from the market is go to the homes and show that they are unsafe. We also have rather long lists of carcinogenic substances. Exposures to these by workers must be registered, the registry must be kept very faithfully, the exposure minimized, and so on. Now the Community is recognizing carcinogenic substances for commercial purposes and that means that we have to agree to change our list of carcinogenic substances very substantially, because it is the absolute harmonizing directive and not the minimum directive. However, we made the tricky interpretation that our earlier list is valid at the workplace but not in the commercial place. So now we follow two carcinogenic lists — one for commerce and one for occupational health and safety. It seems to work.

We have about four to six hundred values in Nordic countries and the Community has, so far, six binding and 29 indicative values. I am wondering how this gap will be narrowed.

Dr. Alexandre Berlin, Luxembourg

An important point is that we are not a Secretariat. The Council of Ministers has a Secretariat. We are not a Secretariat and that's why, from the point of view of international organizations, we are very peculiar. Because many of you know that, in ILO or WHO, the organization acts as a Secretariat to the member states. And as a result, a very practical thing happens. All the meetings of WHO or ILO are chaired by somebody from the member states. The Commission meetings are always chaired by the Commission. For the Council, it's the member states that chair. The Commission takes the advice and the opinion of the member states but it makes up its own mind. Another point is that the Commission has the right of initiative and proposal, which goes to Council and the Parliament. The Council and the Parliament can modify it as much as they want. However, there is always the threat that the Commission will withdraw the proposal and if that happens, the discussions stop. There is no decision. This is a pretty strong weapon limiting how far one can go from the original proposal. When the Commission makes a proposal, it's the services that prepare the text, the draft is then circulated to all the other departments that might be interested. It's modified and then goes to so-called *Heads of Cabinet* of the 17 Commissioners. It's the 17 commissioners who are, basically, the political heads of the Commission. They have to jointly agree on the text to be transmitted. Once the text has been transmitted, it is discussed in the Council or the European Parliament. We, as civil servants, negotiate on behalf of the Commission, in Parliament and in the Parliamentary Committees. On the basis of the draft, which the Parliament will put together with its amendments, there is a so-called *inter-commissioner group* where we make proposals as to whether we will say in Parliament that we agree or disagree. The proposals that we will make will be discussed and we get from that Committee a mandate for what we say in the Parliamentary Committee. If it's in the plenary session of the Parliament, it has to be a commissioner.

Question

This comment is partly for Dr. Berlin, and partly for the United States representation, in as much as the introduction of great amounts of chemical products throughout the world originates in the United States and Europe. Those chemical products are introduced under different processes, with little knowledge of their effects upon the health of workers and the general population. There are regulations for certain chemical substances. This is overtaking the amounts of research subsidies. NGOs have been doing research on probable long-term effects upon the health of workers, but technology surpasses this effort.

Dr. Alexandre Berlin, Luxembourg

We have essentially two situations. First, we have to be very careful because of the duality of what we do in terms of exports. Are we to, in fact, dictate what recipient countries do, or is it for them to say? The only thing one can do is provide information, which we have done. Since all the substances and preparations are labelled, you can demand that exporting countries use the labels. In the framework of the multi-annual research program of the Community, for the first time now in the forthcoming program, health and safety at work has been introduced as one of the components. We also hope — and this might or might not happen — that normally in the European Parliament, the Parliamentary Committee should have introduced the concept of the fund similar to the life fund — a kind of work environment fund, which possibly could then have the external component, as the life fund has.

Mexican Delegation

We are initiating a study of industries situated on the border area with the United States, which are affecting Mexico. We use the Toxicological Resist Release Inventory. The information contained in this database is very reliable. This is the second time that this information has reached Mexico, but we are spending a great deal of money on lawyers, in concrete actions for the protection of health and the environment. We don't now how much truth is in this, and if this is true, how could we prevent this model from entering Mexico as an example?

American Delegation

Depending upon the scale of your study on releases and health surveillance, I think you should consider the Toxicological Resist Release Inventory as a qualitative source of information. It is more or less reliable in terms of reporting the presence of chemicals on the list of materials that must be reported. That may or may not cover all the substances that you are interested in. So you should get that list from EPA. Second, for purposes of dose response, in terms of understanding patterns of health effects, I think it would not be reliable, but it might direct you in certain ways where you would then expend the further efforts to obtain more precise information.

Mexican Delegation

Not long ago, one of the first demands about occupational health damage concerned a company that operated abroad. This demand was filed in the United States. It was considered a very important event because it established a precedent. The company in question was a banana-producing company from Costa Rica or from Honduras, the demand being filed in Texas. This case happened almost two years ago. I should like to know whether there is a precedent

and if there are possibilities that mechanisms such as these may be expanded, let's say, within the NAFTA framework. Also, will the mechanism provide access to information for those outside the US?

Question

A couple of years ago, there was a case where workers of a US company, I think it was a banana company, operating in Costa Rica in Central America, sued the company in the US, I think in Texas, and that was the first time that such a suit took place. It was considered to set an important precedent for the future. I would like to know your comments on how this precedent could be taken for the future in NAFTA. Also, do you think the ability to access information in the US, either through the *Information Act* or any other mechanism, could be useful for companies operating abroad in the US. Finally, I understand that the US based the reporting by industry on voluntary reporting. How does one make sure that the company is not only reporting but also that what it is reporting is reliable? What is the good of having this whole process of access to information if you are not certain what you're accessing is actually a good picture of reality?

American Delegation

Not all data systems are voluntary. The Toxicological Resist Release Inventory is voluntary. The only tool that exists to ensure its reliability is that there are fairly serious penalties for failure to report or to miss reports. And in the first two years of the program, fairly heavy fines were levied against companies. Other reporting systems, for instance under the *Clean Air Act* and the *Clean Water Act*, are not voluntary. There is mandatory reporting and details of the laboratory analyses must also be provided. The analyses must be done according to EPA-approved methods, etc. So those are usually fairly reliable data sets. Of course, the whole issue of the use of data depends entirely upon its validity and reliability. In addition, as I hope we made clear in our presentation, there are tremendous omissions in terms of the kinds of data that are collected, certainly in the US. You asked whether there would be some utility of data availability in the US for you. Yes. I think part of the result of our right-to-know laws has been that MSDS generally are produced and do flow with chemicals down the commercial stream. So that, if a US company were operating abroad, there isn't a legal requirement that the MSDS have been shipped abroad, but the company probably does have the MSDS. If the company didn't supply them, I think you could talk with a US colleague and ask him or her to request them from the US company and send them to you. We request MSDS all the time in connection with patients that we see and, in most of the chemical companies, I have contacts and I can have the MSDS faxed to me within minutes.

A caution about the MSDS. These are put together by the chemical manufacturer. If, for example, we have three different chemical companies manufacturing one chemical, like Dupont and Kodak, each one is responsible for putting together the MSDS. And if you compared them, even though it is on the same chemical, they

might be very different. There is no quality control. While some of the safety data may be very good, for example, flammability, etc., some of the information on product health effects, especially relating reproductive toxicity or neuro-toxicity, may be missing or of very poor quality. While MSDS can be very helpful, you have to look critically at them, because there is no real quality control.

American Delegation

In the US we have authority under the EPA to test chemicals or the EPA can require the testing of chemicals under TOSCA. I don't think we have made the most of that law and, while it may work very well when someone wants to introduce a brand new chemical, most of the chemicals that we have right now have been around for a long time. The existing chemicals may not have been well tested.

Dr. Ellen Silbergeld, USA

Unfortunately, the situation is not as good as one might hope. The testing of existing chemicals falling under Section 6 of TOSCA requires a reasonable basis or unreasonable risk assumption. Therefore, there is a minimum amount of information the Agency must put forward in order to sustain a so-called *test rule* to get an existing chemical tested. With respect to new chemicals, it is unfortunately the case that, since the passage of this law in 1976, its interpretation is that actual testing is not required. A new chemical notification is submitted to the EPA and within 30 days, which is a very short period, the Agency makes an evaluation as to whether actual testing must be required and, again through legal challenge, the Agency must have some basis to require actual testing. You can imagine that, in the case of many new chemicals, this is very difficult to sustain. As a consequence, the US practice has been to rely heavily upon structured activity analysis. This is in distinction from the experience in the European Community and in OECD, where a so-called *base set of tests* has been developed and applied at the minimum level, without exception. Further testing, as Dr. Berlin indicated, is tiered and based upon a number of factors. Recent analysis that was undertaken by OECD, the EC and EPA suggested that both systems have merits and faults. The US structured activity approach is not necessarily without merit and, in fact, in some areas, particularly for carcinogenicity and long-term toxicity, did better than the minimum data set, which is fairly minimal, from the toxicological point of view.

But this still represents an enormous dilemma and I think, as one of a group of three countries, we should consider adopting the OECD approach. We are, as a set of three countries, confronted with some 40 or 50 thousand existing chemicals. Merely to suggest that they should all be tested would make no sense, in my opinion. There are not the resources to conduct such testing. We have to have some system of prioritizing and directing our resources from the private and public sectors toward this enormous burden. A variety of approaches have been proposed and inventive ideas are still being explored. That is certainly an area where we could also contribute our own experimental ideas.

Prof. Jorma Rantanen, Finland

I would like to comment briefly on our US colleagues' report. I think you were probably a little bit over-critical of your own system. I would like to list some merits. One of the most important assets you have in your society is openness. We on the European side could learn from you. That's something that I think you should appreciate and keep as a very important asset.

Secondly, I was very happy to learn that you are discussing the ethics. I personally have learned during these turbulent times that you very frequently have to consult your ethical principles, which are the only thing giving you guidance.

Concerning the chemical system, the existing chemicals are a great problem. We have been involved with OECD on high-production volume chemicals. It was surprising, when we take 10 different parameters for toxic risk assessment. Depending on the parameter, those 1400 high-production volume chemicals met the reasonable testing criteria in 25 to 60 per cent of cases. So, in the best case, 60 per cent of these 1400 were tested properly and in the worst case, which was the ecology, it was only 25 per cent. So it's a big gap, which should be filled. They are used daily in very large volumes. Did I understand correctly that the US is gradually moving from an adversarial system, at least in some sectors, to more a consensus-style system? Also, so far I have always thought that the US pays much more attention to prevention and primary prevention than we do on the old continent. Do you think you are strong enough in prevention?

Dr. Ellen Silbergeld, USA

There is an attempt to move from adversarial to other methods, for several reasons. Many parties are concerned about the delays and the inefficiency of our present system, which now consumes enormous resources without reaching a decision. For instance, over the past 12 years, the US has been consumed in a discussion of health and environment risks of dioxin. This discussion has resulted in allocation of more than \$10 million by various federal agencies and very large amounts of money by the private sector in developing assessments of the risks of the dioxins. No actual regulation has ever taken place. I think everyone agrees this is not a good situation. A move has been undertaken to utilize what are called *market forces* to set a goal by legislation or regulations but then to allow the regulated community and others to arrange for means of attaining that goal, including among them such instruments as trade. There may well be significant limits to application of this. But the new *Clean Air Act* contains a large amount of so-called *market incentive base methods* for achieving pollution reduction.

The other is more an embodiment of practice since, over the past 20 years, most issues that EPA has faced — others can speak to OSHA — have involved interactions among government, industry and environmental groups. I think the question that has been raised is this: why not formalize that process before you have a court challenge? Let's say, for example, that Ethyl Corporation, wishes to

put manganese in gasoline to emulate our Canadian cousins, and we know that Ethyl has made this proposal to the EPA. EPA may or may not deny it. If EPA grants use of manganese, the Environmental Defence Fund will sue EPA. If EPA denies it, Ethyl Corporation will sue EPA. So why not bring the three people into a room ahead of time and say, "Can't we agree on this and avoid those problems?"

American Delegation

One of Occupational Health and Safety Agency's main initiatives in the last few years has been the Voluntary Protection Program (VPP), which is meant to be a less adversarial means of regulating. If a company has a good record and promises to maintain its good record and do the right thing, then OSHA, in turn, promises not to inspect the company. It's a much less combative means of regulating, although, as Dr. Silbergeld says, it raises serious questions as to how to monitor success. On the question of ethics, I thought I might also mention there is a professional code of ethics in occupational medicine.

The one in the US was promulgated by what was then the American Occupational Medicine Association, now the American College of Occupational and Environmental Medicine. The code was promulgated in the mid 1970s and is a very good ethical code. It's comparable to the International Commission on Occupational Health (ICOH) code, but just three months ago, a revised code was issued, which represents an enormous step backward. A lot of the so-called *ethical precepts* in the initial code were removed. There is a counterattack beginning now within the occupational medicine community, but it has been a very interesting evolution of professional occupational medicine. The organization that issued the code is mostly an organization of company doctors, of corporate physicians and private sector people. Apparently, the sentiment in that group has become much more conservative over the last 20 years. Under the new code it is much easier to be ethical. Almost anything you do is now ethical in occupational medicine.

Dr. Kathleen M. Rest, USA

I have a brief comment on your perception that the US was always much more involved in primary prevention. I think this, actually, is a fair misperception. There has not been enough focus on primary prevention in our country. I think we look to the European Community for new information about clean technologies and pollution prevention. We're looking at emulating models that we see coming out of Europe and Scandinavia. We do fairly well with secondary prevention. We have been good at end-of-pipe controls, at trying to detect contamination and do remediation, but for primary prevention, I think we have a lot to learn. As I said this morning, there is a whole new movement toward pollution prevention and source reduction, which is very welcome, but we have a lot to learn in this area.

Comment

When we get into a meeting like this, we tend to look at primary prevention. But if you are in the more medical world, with a clinical model based on individual patients, there has been a tremendous effort, and I don't think it's just by accident, to look at lifestyles as something that is to be managed by the individual and the patient rather than by society. The Canadians who spent some time looking at what's going on in the US should note that a lot of this problem came from the Lalonde report, which got it all started. And that has been distorted beyond recognition in your neighbour to the south, where issues that could be solved by society or institutionally are restated to blame the victim. That makes primary prevention seem very distant in the US.

Dr. Mauricio Hernández, Mexico

On the regulation and enforcement theme, it seems that the United States has a very large regulatory apparatus, and it seems that its enforcement is adequate. However, I have heard at other fora that the number of inspectors by industry is somewhat reduced to be able to carry out a complete inspection process, and that inspections are not to standard quality. I should like to know how much money is required to have an enforcement of that type and whether it is appropriate to institute it in a country such as Mexico, that is, whether to develop this type of system in a country, where often the government does not have full credibility, is feasible. In other words, in a country where inspectors do not do the job they ought to. Instead, they inspect other aspects. In view of this, would it be worth our while to demand that a country such as Mexico develop an infrastructure and the human capacity required to have a system such as this? Dr. Berlin has told us that the most important aspect is financial. What I would like to know is whether anyone has any idea of cost in the United States and whether the system is operating properly or has any defect, let us say, by comparison with an ethics or consensus code with industry in order for them to carry out their own surveillance.

American Delegation

I don't have a simple number but there are certainly numbers available to indicate the cost of the regulation system. It's very interesting, because a few years ago, we tried to develop a small research project at Boston University to look at inspection as an element of regulatory and enforcement systems. The interesting problem was the idea of unifying principles around inspections and application of strategic principles following inspection, and an effort to gather information and see whether or not compliance exists. We could find in the US very little interest in the public health community for studying how to make best use of inspection resources. That's where our shortcoming is. There are not enough inspectors. Perhaps we don't need as many inspectors as we thought if we start with a strategy for inspection and move to an enforcement strategy that follows. I would point out that in the US, OSHA went from a program that is clearly intended to prevent, to a situation in which employers were willing to make corrections only if

the inspections occurred, because the penalties were not sufficiently high to be a deterrent. For instance, an inspector might come and levy a thousand dollar fine, where the violation had been there for the previous five years, and the employer has known about it, and chose to put the money in the bank, earn interest and then pay the \$1000 if he was unlucky enough to be inspected. That was a pretty good strategy on the part of the employer. And I would urge, for example, any of these systems to look very carefully at the distinctions between wilful, as opposed to negligent violations. Wilful violations must be treated differently.

Dr. Ellen Silbergeld, USA

This may be relevant primarily to the environmental sector, but the cost of regulations has been varyingly estimated as high as \$200 billion a year by the Chemical Manufacturers Association. My suggestion to you is to consider emulating one good aspect of our experience and that is the ability of citizens to function as inspectors and enforcers in the environmental arena. I don't need the EPA to get after Dupont dumping chemicals in the Delaware River. I myself can file a complaint with state and federal authorities and can activate the enforcement response. So that for the environmental side, I think we have accomplished great efficiencies by enlisting the public as part of the process.

Dr. Howard Frumkin, USA

If you get into the cost-benefit evaluation of an enforcement program, there are lots of hidden costs and hidden benefits. First, It costs a certain amount of money to maintain your inspector staff, but the government makes money by collecting penalties. Second, if one of the effects of the inspection program or enforcement program is to prevent injuries, that's a cost saver. Where, within the system, the costs are saved will vary from place to place. It's a tremendously complex undertaking to evaluate the financial impact of an enforcement program.

Dr. Kathleen M. Rest, USA

I think one of the things we failed to do in our country was to use a lot of the data we have to help inform our inspection and enforcement. For example, we don't use worker compensation data to inform our inspection strategy. We don't necessarily use employer-generated exposure data. We don't use chemical-use data that's available to inform our inspection strategy. I recently completed a study in British Columbia, where they had lots of data, which wasn't being used very well, to help them target their inspections and come up with a rational strategy.

Comment

I would only disagree with Dr. Frumkin in one way, which is to say that at some level this is a very simple decision analysis, not a very complicated one, as compared to many societal decisions. These are ones where you can lay out most of the cost, most of the benefits, and where the decisions are made. It's amazing how rarely that's done for these schemes.

Dr. Alexandre Berlin, Luxembourg

Both in the Community and in the three countries of NAFTA there are technical institutes drafting standards. Most of the technical standards put together are financed by the Community. But we are also financing the technical bureau for the trade unions, so that the trade unions will participate fully in the setting of technical standards. In the US, public participation is important in the technical standard-setting procedures, with interest groups and trade unions participating fully. What is done to facilitate their participation? That may also be a question in Canada and in Mexico.

We have been hearing about costs of improvements, but not about benefits of improvement. On another topic, to what extent, could better management lead to more efficient, more quality-control-based thinking, to better products and, as a result, lead not to a cost for improving health and safety but to benefits? Have there been any analyses on this?

Dr. Ellen Silbergeld, USA

The American National Standards Institute and various other organizations that do work on specific areas of technical standards do invite public participation because, although they are not required to, they understand that their products will have a better acceptance if they are presented as having had public input. With respect to the cost and benefit side, I think this is very difficult. At one level, what you are saying is almost a perfect expression of Milton Friedman and the pure market theory — that perfect markets will ensure perfect workplaces because they will eliminate all barriers to maximizing profit, and that one will assume that, in a healthy workplace, a safe product maximizes profit. That's the world according to Adam Smith, Ronald Reagan and Margaret Thatcher. I do not think it is the real world. I don't think there are perfect markets.

There are many barriers to markets, one of which is information. But more than that, I think there is both short-term and long-term profitability, which interferes with market perfection. You will recall the classic economic theory as time-independent, so it does not accommodate the notion that it might be more profitable, for instance, for Merrill Dow to market silicone breast implants without testing them and to put some money away for a trust fund to pay off the victims of an imperfectly tested product. So, I have less hope that one can do a cost-

benefit analysis that will conclusively urge that improvements in health and safety will necessarily balance on the cost side. In the short-term, they may not. That's why the ethical commitment is unavoidable in our discussions.

Comment

There have been a couple of analyses of the effects of workplace regulation, which were resisted strongly by industry. For example, our cotton dust standard and our vinyl chloride standard, where the industries basically said: "If these are implemented the costs will be so great that we will be put out of business." Well, they were implemented and several studies actually have been done that have shown not only were they not put out of business, but they actually profited because of the engineering controls that had to be brought in.

Dr. Roberto Sánchez, Mexico

I am interested in the discussion that dealt with the ethics code, a topic we are dealing with right now. I should like to ask the US group about some of its thoughts in terms of the incomplete process of structural change within the global and economic system in which our countries are engaged. I recognize, for example, that there is now a transnational capital, way above national interests, that operates much as it does in the United States or in other countries. I wish to know how this new structure is linked with the ethics code, with possibilities of action, with activities relating to technical standards or process standards, with an interest that is more social than economic, even if it has an economic benefit. Above all, how does this structure deal with social inequities, that exist in each of these societies? You spoke of this as one of the problems, dealing with it as part of a racist approach that guides many of the problems toward areas of minority groups, etc. I wanted to ask you your thoughts on what the trends are, and what are the opportunities you see within that new action context in the United States.

Mr. Roy Hickman, Canada

I want to bring us back to this question of regulation because I was disturbed by the fact that we spent so much time talking about inspections. The reason I was disturbed about it was that I believe we have to think about the options for prevention. Inspection is not the only option available to us.

At one time, I had responsibility for inspectors. One of the problems with inspectors is that they like to choose where they go and they want to meet with people who really know what they're doing or else they can't chat, have coffee, etc. We must look at the question of self-inspection. There are ways of setting up criteria, where in fact companies can exempt themselves, if you like, from such frequent inspection by being made responsible for certain underlying approaches. One of the compensation boards in Canada took a look at whether or not it could put money back into the system but do so only for companies that agreed to undertake audits. Now they have had training program for auditors, they have

qualified auditors, they certify auditors, companies can choose to have audits done by them, and if they keep pace with the auditors' requirements, then they are registered with the board and their assessment rate is dropped, so there is a financial payback. They also receive recognition as companies that are doing well. So there is an image issue. It's possible for them to use it in selling their products, to say we are a good citizen, we were audited, we keep good standards, and so on.

There is a program also operating in part of Canada, which requires that if you are going to build a new plant, which costs a certain amount of money, then you go to government and tell them you are going to build a new plant. Government then assigns somebody to work with that company so that, at various points, the issues about proper engineering, what sorts of chemicals are going to be used, health and safety, training, and all the ancillary things are thought about at a very early stage. Therefore, you don't end up with a plant that you want to close down after the first day of operation because they haven't thought about any of these issues.

Comment

There are a lot of creative things that we can do in addition to regulation, inspection and enforcement. One worry I have about this whole new push toward self-inspection or internal responsibility or self-regulation is that, in our current climate of stiff competition and fear of unemployment or job loss, it could very well be that, within one plant, labour could agree with management in order to save their jobs, to relax safety standards. While I feel we should think creatively about self inspection, I don't think it can ever really replace some other agency having the authority and the ability to go in and check. There is just too much pressure these days.

Comment

Dr. Gibbs' comment reminded me of an interesting development in NIOSH back in the late '70s, when it was useful to bring a good physician into NIOSH. These physicians were spending a two-year rotation at the Centres for Disease Control in the Epidemic Intelligence Service and we wanted to attract them to NIOSH, partly because we believed that occupational health was a legitimate area for physicians. What I didn't understand originally, and what became very important, is that they were better on health hazard evaluations and got closer to what was happening with the workers than did the industrial hygienists. And this bears on a kind of sociological explanation of the ethical issue, which is that, when the industrial hygienist goes out, he or she likes to rub shoulders with the engineers and management in the firm, and, frankly, they aspire to future employment there. In most cases, the young physicians, never having been in a dirty, noisy, dangerous work environment, had immediate empathy with the workers and were much more responsive to what the workers were saying than were well-trained industrial hygienists.

Comment

I'm not going to defend physicians any more, but there is one other element that I think is important. The physician has an edge. Who plays golf with the company president? It's an important question, because, if you want to influence a company and you want to have something happen to the workplace, then, in effect, you have got to get at top management.

FUTURE AGENDA, STRATEGY, PROJECTS

Mexican Delegation

I believe that, on the subject of NAFTA, there are already dozens of commissions. The great value of a commission arising from this group would be that it could deal with difficult problems, problems no one else wants to touch. I've identified four such problems: first, alternatives to prevention; second, alternatives to enforcement; third, standardization; and fourth, the ethics problem. A comparative study of the legislation must have been done already. I do not think that NAFTA would have been signed without a prior study of the legislations involved. It is better that we inform ourselves, rather than to make an effort that has been made previously. The four points I am suggesting are points that have already been criticised with respect to NAFTA. If we seek alternatives for this, we arrive at an important document, and this should be one of the first tasks of this Commission.

Dr. Mauricio Hernández, Mexico

I would like to return to Dr. Gibbs' initial question in connection with what we wish to accomplish at this meeting. Right now, I remove Mauricio Hernández's hat and I put on the hat of the National Institute of Public Health, because we also have a commitment, by participating in this meeting, as organizers and as a conceptualizers. In our capacity as an Institute, we have come to the conclusion that there is an important, scientifically validated information gap in the decision progress in Mexico. What I would like to take from this meeting is a research agenda, in order to be able to invite groups to undertake this research, either with money provided by IDRC, or by CONACYT, by the United States-Mexico Foundation or the Ford Foundation. This would be, let us say, a secondary mechanism, and our negotiating strength will depend on the strength of the proposal we may put forward. The idea of the Mexican delegation was to combine all those aspects, which more or less represent the people who came. We have people who come from the decision-making side of the system, the academic side, and the operating side of the IMSS. I believe that it is important to concentrate on this. As for me personally, I would like this meeting to produce a research agenda or, at least, a series of concrete questions, in order to invite research groups to resolve the problems.

Mexican Delegation

Based on what has been said until now, and perhaps moved by the sentiment of this meeting, I fear that the result of this will be a work excessively theoretical or excessively conceptual. That is what is supported to a great extent by the results of the working groups. They elaborate on a very developed thought, and that certainly creates a refractory sentiment on government people. We do not enjoy theoretical lucubrations and theoretical disquisitions about things that seldom have applicability. The three countries must learn to administer new risks, social risks, socially accepted risks. Perhaps we may not have an exhaustive list with the names, hypotheses and variables of the projects we would all like to have. But we could identify which criteria should be employed to evaluate acceptance or rejection of a project on the basis of what its theoretical usefulness would be for the development of knowledge, and the practical usefulness on which the government may base its decisions. I believe that these two conditions, if they are met, may be acceptable because they may truly influence decision-making and may be supported and approved by society.

Dr. Roberto Sánchez, Mexico

It seems to me that the type of discussion we've had has been useful in two important aspects: in terms of the system and how it operates, and in terms of weaknesses and opportunities for other countries. I believe that it has also fulfilled an important role in personal terms, as it has been a means to get to know each other better. Above all, it has laid the groundwork for this to become a broader joint working cooperative. Perhaps what remains to be done, which would be the most important thing and one of the main reasons for our having met for these past three days, is to be able to translate all this into something concrete under the idea of parallel coordination and research teams devoted to studying national environmental and occupational health, and perhaps other issues. Some ideas have emerged, such as the creation of a working network, some research topics, etc. We all have a background document where mention is made of action plans, initial phases and, especially, about the provisional matrix for a cooperative study of occupational and environmental health among Mexico, the United States and Canada.

We have worked on evaluation and concepts of system models, not only with the three countries, but with the European and Finnish experiences. It remains to design a study framework, create strategies to evaluate industries, establish time lines, resources and capacities, etc., identify researchers and establish a working network.

Starting from these ideas and the document that was circulated, I would like to add a few things. The capacity of a group such this can go beyond the research idea. I believe that, if a network system is established, we could have several types of actions. Some could be recommendations for a national network and others could be specific actions, because actions can transcend research. These

could be actions, or recommendations in terms of information. I am thinking, perhaps, of an exchange of information between countries. We were talking about the example of inventories of toxic emissions in the United States. That may be useful in Mexico or in other countries.

Another idea mentioned was training, and two training levels. On the one hand, there is training in education, creating cadres exclusively through Master's programs for graduates, or even Doctorate degrees. Training and enforcement in supervision are important, as is training inspectors, with the capacity to improve levels of environmental and occupational health protection.

If we work with the matrix idea, perhaps with each of those points there could be subdivisions. A recommendation, an action, or an idea for a concrete action, would have to be aimed at a particular group. In other words, if we wish for a training or education training program at universities, it will be aimed at institutions such as NGOs that undertake that type of work. If we work with information, it can be aimed at NGOs, labour unions, the government itself, or other groups. It is very important, therefore, to identify action targets, and to identify the time required to carry them out, as well as the resources required to put them into practice.

Comparing the three countries and the diagnostic level, we would have several components on which we could cooperate. At the legislative level, we could compare legislations in the three countries, with a subdivision at a federal level, and at the state, province and local levels; this, in turn, constitutes a divided matrix. In order to systematize the process, perhaps it is important to detect, in each of the points in the matrix, whether there are problems or similarities between the countries at these levels. For example, as far as legislation is concerned, is there any similarity between Canada and the United States at the federal level?

We could do the same with environmental health. With this data about actions, on the basis of the document we present we could explore comparison problems with respect to the legislation, standards, enforcement, and enforcement efficiency. We could evaluate existing mechanisms and how these mechanisms operate, or do not operate, at the federal, state, provincial or local levels.

Another level would be information — and here we would have to differentiate three aspects: information availability, access to information and volume of information, whether that information exists at the federal, state, provincial or local level.

Finally, intervening actors: a comparison between what is the role, the depth and the level of action of those players, among the countries; for instance NGOs, industry itself, companies, both industrial and farming, labour unions, and other types of actors intervening outside the public level. Our work would not necessarily have to be limited to a single diagnostic. I believe that a group such as this, and a network of the type we could establish, can take us on to compare, to

study the comparison, and above all, to suggest recommendations or other types of actions, thinking still more in strategies contributing to the process we wish to modify. And here we would have the same components: legislation, standards, enforcement, efficiency, information and actors, although we would have, perhaps, to define another type of parameter within the matrix: what type of actions there would be.

These are two components: recommendations or actions. We would have to set priorities and time frames. These are strategies we can realistically undertake, either short-, medium- or long-term. We could do the same thing to invent the matrix. This is only a suggestion to provide orientation to our discussion.

Dr. Ellen Silbergeld, USA

I am concerned about committing ourselves to a very ambitious project before considering two primary issues, in line with Dr. Rantanen's presentation. I myself feel a greater need to understand the potential similarities and differences in the content and context of environmental and occupational health among our countries. We have had a description of the workforce and workplace in the US and to some extent in Canada and Mexico. To what extent are they similar? To what extent are there trends that we expect to occur in these areas? To what extent do we see potential for migration of similar situations from one component of NAFTA to another? And, similarly, with environment. So, perhaps I am backward in my knowledge but I feel a need for that. I am also concerned about your matrix because, behind specific laws, regulations and standards is a whole social and political context in which laws are implemented and enforced. If you were to read the text of the environmental laws in the US, you would really have little understanding of exactly how they are implemented and enforced because that comes from a larger legal and political culture. Some of this I tried to present but I didn't do a very full job. It's easy for us, for instance, to admit that we live in a litigation-driven culture but I know there are lawyers in Mexico and in Canada and I know there have been "toxic" court cases in Canada, so it would be interesting to know what the context of that kind of activity is among our countries, as well, before I could see us undertaking such an analysis, which could potentially be misleading if it didn't have the deeper context.

Dr. Roberto Sánchez, Mexico

I should like to clarify that the crux of the idea was only to systematize somewhat the process and perhaps what you have just said is important in the sense that all these ideas of joint work, if they could be included, are simply ideas as to how the process can be systematized. I would suggest that people should begin to propose what type of research we could jointly undertake, and perhaps tomorrow, at a later stage and with more time, we could analyze and establish priorities and resources available.

Comment

As always, it's hard to decide what research one is going to do unless one knows what one's resources are or has some estimate of them beforehand. We hear about a huge secretariat in Europe that carries on this kind of work on a day-to-day basis trying to keep up with everything. Many, many reams of paper probably come out of that. Somehow, we have to find a compromise. I think there are things that can give us guidance as to how we should hone down. What are the impacts on people's occupational and environmental health in the three countries? If we are going to look at international health, we can't just look at other people's systems or other people's problems. We can't identify Mexico as the problem and ourselves as perfect, or just look at similarities and differences. We also need to look at the fundamental dynamics. In other words, the conceptual framework may be less a detailed documentation of what exists as an understanding of the fundamental dynamics of what we see happening to occupational and environmental health.

I would like to suggest at some point a real brainstorming session on all the types of research we could do. There is a whole range of them. Some of them are specific projects that this group may or may not take up per se but feed into it. For instance, evaluation of inspection might be very interesting and there might be funds available in different countries to do that.

The third thing that I think is important is for us to ask what our relationship to these commissions is going to be. What role are we planning to take? That may sound a little like political action. I don't think it is. I think there is a clear statement about the importance of technical committees and technical input to the commissions. I think we may have a recommendation role and maybe some future role in terms of feeding into that process on an ongoing basis. It may be that we are some kind of nucleus for a transitional period, which eventually is taken up by larger institutions such as the Institute of Medicine itself. But we almost need to have a five-year strategy.

Prof. Jorma Rantanen, Finland

I think it would be good to evaluate the weaknesses, make some comparative analysis between the three countries, then with the European system and then to assess the systems against a national standard, like the ILO Convention, which is still a good standard for occupational health. Similar standards will be found for environmental health. Then some kind of interventions would be appropriate. Finally, development programs, which certainly need the Commissions's support, would be in order. We had, in Moscow, a couple of months ago, a meeting on occupational health in countries of transition, where we discussed precisely the same strategy. We also decided to organize a symposium soon, where communities from outside countries would take part. In Moscow, we discussed the minimum requirements for national occupational health systems: legislation, standards, inspection. What is most important is the front-line service. You have

to have some kind of service that is always present and doing the real job. Research and information systems will support their work. For instance, in Europe we have about one doctor for two to three thousand workers in manufacturing industries in occupational health services. A similar type of ratio can probably be estimated for environmental health services. Without that density of expert professionals, you cannot imagine too much practical impact.

Mexican Delegation

I should like to add that, tomorrow, we ought to use our time to define the basic question of who we are and what it is that we wish to accomplish, because the orientation of this conference will depend upon the answers given and because, even if we discuss things, if we make some progress, if we do not have a clearly defined objective, I believe it will be difficult to undertake a much broader function. I would suggest that perhaps we could think overnight about a definition of who we are, where we wish to go and how to simplify the process.

Comment

I think we need to step back and ask a few questions. For whom are we preparing this report? Who is the audience? Where do we go from here? Is this a working group of IDRC, which then leads to some actions? Is it a broadly focused document, or is there a document at all?

Dr. John Markham, Canada

The idea was that IDRC act as a stimulus, an unbiased body that could bring groups of concerned people together to look at the environmental and occupational health systems and to make the best recommendations they can. The reasons have already been stated, largely because, apart from our general interest in health, we see that if we have a focus in North America of first-class plans in occupational environmental health, it will spread to Latin America, it will spread, if it's worthy, to the Pacific Rim countries, which are looking for this sort of thing. We are a research-granting agency. Our funds are fairly limited, but we have many contacts and many links and if the researchers from the three countries can prepare plans, which together attempt to form the best occupational environmental health systems possible, then we can provide some funds and encourage other donors to come forward. I think that if there is a way for us to play a part in the long run as some kind of clearing house or networking center or secretariat of a very informal kind, we would be very glad to do so. There may be other people who would be better qualified to do it. I make these suggestions. I can't be more concrete than that because I don't exactly know what you want to do and that's what we wish to find out. We do intend to have the proceedings of this group published.

Comment

Other things we need to define in very broad terms are strategic objectives and possible mechanisms by which to achieve them. For example, we could make recommendations through formal channels within the three countries that a pool of money for research and for networking be established, leading to definition of the minimum requirements for occupational health services. It's important, as I see it, that this be kept separate from the regulatory framework. It seems to me important to let the regulators know that research is underway, but that it is not standing in the path of their regulation.

Dr. Mauricio Hernández, Mexico

I am somewhat concerned by the direction this is taking. The fact is that we are all very busy people, and coming here represents a great expense. IDRC has invested heavily in this meeting, and I believe that we should be a little more ambitious about what we may decide tomorrow. What we are saying is that tomorrow is a crucial day. Unfortunately, there is some urgency in all this. We are all trying to achieve some improvement in the occupational and environmental health system. We must be practical. Political times and the situations in our respective countries are very different.

Mexico is going through a critical moment. Anyone who understands the Mexican political system knows that the present and future months may have a dramatic impact upon our system because every six years these types of actions are defined anew. I should like to see us get to a more concrete position. I should like to see a research agenda with people being assigned to prepare papers, requests or proposals.

Comment

I think that the most strategic objective of this endeavour is to establish direct collaborative collegial ties among occupational and environmental health professionals to facilitate long-term ongoing exchange of knowledge and information on a vast variety of issues, be they ethical, scientific or technical. In a sense, the actual report that we write or the content of the research is almost secondary to the process by which we achieve it, because the long-term benefits will be the ties themselves. It would be nice if the research agenda actually had an impact on the decision makers and resulted directly in changes, but I tend to be somewhat cynical in thinking that would happen, at least in the short run. However, the process itself will definitely have long-term benefits. At the same time, we should put a lot of attention into trying to make the research agenda as useful as possible, and something that may have direct implications.

Dr. Anthony Robbins, USA

I am concerned that this meeting has not done an adequate job in describing the free trade forces and what their applications are. I don't think there is a consensus on that. I also think that we risk being colleagues who have all lived in this world putting together a rather parochial report. Maybe that's all we can do. Maybe I want to push you farther than, in fact, anyone can go. I recognize that NAFTA is more important in Canada and much more important in Mexico than it is in my country. I'd like to know if this group really thinks NAFTA and the resultant relations between our three countries, provides any real opportunity for a quantum leap in any of these areas. If it doesn't, then I predict that the fields of occupational and environmental health are destined only to be as good as the economies will tolerate. So, without making it a capital *P* for *political*, I think we need to engage in a more serious strategic discussion about whether there is anything that can come out of this meeting or any process that we can start that will make a difference. A big difference. I'm worried about the fact that we haven't had that kind of strategic discussion. I am not sure I have a great deal to offer but I come back to the fact that we risk this being a not particularly interesting and apparently parochial discussion if and when we publish it, unless we have gone a step farther. There are lots of good ideas around this table and we need to accumulate them in a way that makes a real difference.

Mexican Delegation

I should like to review two things with respect to tomorrow. A fundamental aspect is the definition of the group itself. Do we wish to be constituted as an action group, even if this research is limited in scope? Do we wish to be constituted as something else, such as an information exchange network, a body influencing decision-making? Another important point is that of defining objectives. Our motive for coming to this meeting is that we should end with some type of concluding product. If the product is that the group is going to work, the question should be: what is the scope of that work, and how will this work provide benefits for each of the countries? Also, it is important, once the group's objectives are defined, that we consider the means to achieve them.

Many of the Mexican delegates agreed to come to this meeting because we feel that the present opportunities should be taken advantage of at the right political moment, when structures are being defined, or they will be lost for a long time. Quite probably, it will take many more efforts and resources for us to be successful in all our decisions if we arrive when structures are in place, than if we make our proposals when these structures are being created.

Dr. Ellen Silbergeld, USA

From the environmental perspective, it is always an advantage to enlarge the scheme of one's research and analysis, because we operate from the assumption that the ecological unit is the planet and the imposition of political boundaries is an inconvenience to research and protection. So there is no question in my mind that there are vast opportunities from the environmental perspective. What I have heard suggests, however, that there may be some more proximate focus for our discussion, which will offer research opportunities as well as lead more directly toward action. I have heard a great deal about data and information. It seems to me useful to consider, and I have heard anecdotal conversation from Dr. Hernández and others, that there are barriers to obtaining information that is available in the US. What are those barriers? Are they real? What would it take to lower them? Why should not information available in one component of NAFTA be freely available to any citizen of any country in NAFTA? And, in addition to information of the simplest sort, a broader context of technology transfer and more complex information systems could be exchanged. Why should that not be as available between Mexico and Maryland as it is between Maryland and California? I don't know of the situation in Canada.

The reverse is the acquisition of information. Why should not data collection systems be integrated and formulated on consistent principles so that data can be grouped together? There is a great magnification of power, as we all know, of statistical analysis if we have larger data sets to utilize. What are the barriers to that kind of integration and data collection? Could it support monitoring and surveillance? Could it support registries? Could it support data on disease systems in the environment and occupations? What are the barriers to doing that? How can we in the US benefit from advances that appear to be in place in Canada? The issue of harmonization of standards, I think, does require some consideration of how to do this. When is it advisable and to what extent? If we truly thought of ourselves as North America, where would we place research centres and centres of training? How would we allocate them among our populations and places of need and interest? Are there ways to foster cross-national training through research and fellowship programs? Are there specific or general encouragements to give to multilateral research?

Finally, I have to admit to you, that I came here with four agenda items for my colleagues in the Environmental Defence Fund and they would feel disappointed if I didn't mention them. These are issues in which they think NAFTA would be very helpful.

- If we enlarged the concept of endangered species and habitats to include Mexico and Canada, it would increase immeasurably the protection of those species and habitats because those organisms migrate, seeking refuge in one or another of our countries. If we had consistent standards, we would, I think, enlarge the protection of those species.

- There are decisions being made individually in our countries related to transport and energy exploitation. How efficient would it be for us to make those on a multilateral basis?
- There are lessons and concerns related to sustainable agriculture, which are very important for us to consider among our different environments. We range from tropical to arctic environments but there may be lessons that we can learn there.
- How can we have an integrated system of hazardous waste management, so that we are not shipping things to other countries or receiving them, but can take advantage of possible technology transfers, toxic use reduction, or even just efficiencies of scale for such things as low-level radiation management? We are fighting in our country about where to place regional systems for radioactive waste management. I don't know what's happening in Canada and Mexico, but it seems to me that there is a rationale for increasing the scale on which we discuss these very difficult issues of management.

Dr. Alexandre Berlin, Luxembourg

I was wondering if you shouldn't ask the question first: Who are you and what do you want to represent in order to deal with these items? Do you wish to consider yourselves as a tri-national scientific and evaluation lobby? Are you three national entities or do you want to see yourselves in relation to the environmental commission in Montreal or the health and safety commission in Dallas as an entity of a tri-national nature specifically looking at NAFTA and not at national agendas? Should you try to identify yourselves in these terms and look at what are the NAFTA opportunities for this tripartite approach? Is it trying to change NAFTA and the limits of the commission, which is a defensive approach, into a positive innovative approach and then as a tripartite scientific research and evaluation lobby? In what way can you try to move the agenda of these commissions of NAFTA toward a positive innovative approach? What can you contribute to it?

Comment

I have been stuck by the same questions myself, because I'm not sure what we are. At one extreme, we could think of ourselves as a dissident rogue group of environmental and occupational health people outside the functions of our governments or of NAFTA, making independent recommendations. Lots of us have been in that role before and are comfortable there. But that's not really who we are.

At the other extreme, we could think of ourselves as a quasi-governmental body — after all, look at the three institutions that assembled this group. We are closer to government than we are far from it. My inclination is not to try and answer the

question now. It wouldn't surprise me, in five years, if we were the research institute portion of the commissions or something like that. It wouldn't surprise me, also, if we are the beginning of an independent think tank. Whatever we are, eventually we have to be many more people than are at this table.

My inclination is to set a short-term goal. I think we can help define who we are over time. The whole process is too new now for us to situate ourselves very easily. I looked at the matrices early on. I have to admit that I was put off because I didn't like the idea of conducting yet one more study. In conversations over the last couple of days, I have heard people say that the result of our efforts shouldn't be just study, but should be action. And I was really pleased to see those two words show up on your slides.

What if, in three or four months, we plan a second meeting and, at that meeting, we have assigned a series of specific issue papers to be prepared, using a matrix something like one of the ones we have seen. We come back together and the specific assignment is not only to do a three-way comparison to describe the current situation in North America, but then to address the question within this topic of how we could use NAFTA as an opportunity to make North America a model. How can we move from where we are now to where we ought to be? Recommendations will emerge from that. Some will be for further study because we will conclude that we don't have enough information. Some will be for training programs or for interchanges of inspectors or for modifications of industries. I'm deliberately suggesting a short time frame.

Dr. Rantanen's suggestion that we get a couple of senior people to do profiles of the countries is not that big a job, really. If information systems were one topic, for example, we could pick three people, one from each country to, in a couple of weeks, describe their own information systems, get together on a conference call or by E-mail and come up with some recommendations and then be prepared to present them. If, in a few months, we did that, I think what would emerge from that would be a much more concrete sense of where we ought to go next. We would produce study agendas in some cases, and we would produce recommendations for action in some cases, and, by then, events would have made it more clear to us how we should relate to the commissions. That would be the short-term recommendation. The very short-term recommendation I'd make is that, before we do anything along the lines of recommendations, let's spend some time, maybe tomorrow, talking about broader issues and about what we really hope to accomplish. So that, if and when we go off and do specific comparative mini-studies, we are all very clear that we are singing from the same song sheet regarding the differences we hope to make.

Dr. John Markham, Canada

IDRC does not regard itself as an agent of government in any sense. We never receive a phone call from a Minister. All we do is receive money and disburse it for research. And because of this we want to ally ourselves with the Institute of

Medicine of the National Academy of Sciences in the US and the National Institute of Public Health in Mexico, which we regard as being in the same position.

Comment

I totally agree with the idea of the follow-up meeting. I am not sure that it should be restricted to this group. I don't even think that the addition of five or eight extra people may work. A much larger group, in which we could bring a broad range of people, but also from the higher policy level down to the grassroots level, might be useful. I would agree with you, it would have to be very well planned, the idea being that we could leave that conference with a very concrete set of actions in the various domains that we would decide to tackle. On the question of funding, my feeling would be this: let's think about what would be ideal and then we can worry about funding later on. I would make a suggestion that, tonight, people might do some thinking. We are indeed moving toward this idea of a larger North American conference and who do you think should be there? What kinds of topics should be addressed? What would you hope to gain out of that? In case we do revisit this issue tomorrow, it would be interesting to have some thoughts to that end.

Comment

Perhaps we should agree on criteria for the suggestions we bring forward tomorrow. We already have some on the table but, whatever the proposal, it should not have only theoretical benefit, but have some practical implication. I add that the methodology should be collaborative. If we end up with projects that the Americans do themselves, Canadians do themselves and Mexicans do themselves, we will have lost an opportunity. We shouldn't do three separate projects that are then brought together. I propose that the criteria for the concrete suggestions be that they have theoretical and practical benefit and that the methodology be collaborative.

Prof. Jorma Rantanen, Finland

We have, between the five Nordic countries, a group dealing with occupational health and safety. We used to meet about twice a year. We have accumulated quite a role in Nordic countries. We started as an institutional group organizing one Nordic meeting in occupational health per year, which has gone on for 13 years. We started an environmental health journal, first as a newsletter and then as a journal. Gradually, Nordic governments accepted us as an advisory group for responsible Ministries of occupational health and safety. Now we are an official advisory group to Nordic governments. We get the two million crown budget from Ministers and we now run 10 projects, which are very carefully selected, because we look very much at the added value. We do only those projects that it is not possible to do at the national level. We started simple training courses, which the then Ministers decided to institutionalize. We are now the Nordic Institute for Advanced Studies in Occupational Health and Safety. Probably this

could be a perspective for this group and we, of course, would be extremely interested in collaborating.

Comment

I thought the way that such a group could move forward to whatever end product it specified would be to work rather than having large conferences. Large conferences are useful, but don't move quickly to the next step to identify what might be clearly defined in short-term and eventually long-term products. We should look at having expert working groups where people from outside this group are identified from the three countries. These groups could produce papers that clearly define what we know, where we are going, the key issues for research, the key gaps in knowledge. By proceeding this way, you involve and utilize the expertise you have throughout the countries and you are also able to link up with the authorities in the various countries and the mechanisms to move forward. In other words, people may argue with us as a group with respect to how we define ourselves, but they are not going to argue with a group of experts whom you have brought together from within the three countries.

Dr. Christopher Howson, USA

Let's revisit this issue of the conference. I didn't have in mind a conference that would merely be an information exchange where people would get together and just talk and write a report. I was thinking about something that would serve two purposes. One, it would draw in a broad range of people and get them to buy in, because I am very concerned about that. It's nice talking about setting up task forces and meeting and doing the kinds of things Dr. Rantanen was suggesting — for example, the newsletter, which I think is an excellent one — but I am really concerned about the funding situation, at least in the US. I spend a lot of time dialling for dollars and trying to get projects funded, international projects with a global perspective, and there is not that much interest. So, I was also thinking about a conference as a means to bring some visibility and to draw people in, and they would have to be very carefully selected.

Dr. Jean Yves Savoie, Canada

I see this present group as a think tank for the larger meeting. It's very important, because we are trying to find areas where there is either lack of information, forthcoming information or lack of knowledge that we could accumulate by descriptive research that could fill that gap and help anyone else who wants to use it — commissions, governments and up. This we do very frequently in Quebec as a research institute. We could get to a few practical things that we could aim for and products or objectives, and that will be a starting point.

We have identified 15 areas of concern for research. We have described eight of them. I am not sure we can cover everything. I still don't know what I am doing in this group. If you want to go farther after this meeting, the group has to define

itself, and people around the table must define themselves. The people here have some backing by way of their institutions. If we define a few objectives and end points, then we may convince quite a few people to jump on board. I suggest that we work on these lines and tomorrow we can outline a few specific objectives. But I am not sure we are going to have a very large research agenda. It took me years in one field to get one. It is very difficult. I should not be too optimistic.

Dr. Graham Gibbs, Canada

I don't think we should go to bed worrying about who we are. I think we are an *ad hoc* group of experts in the occupational environmental health field who have been brought together to look at the issues that affect NAFTA. We were brought together at the invitation of IDRC. It seems to me that every initiative that gets started has to have such an *ad hoc* group. It doesn't start otherwise, except maybe by political mandate. But we do need to think about what mechanisms should be put in place for the future to achieve certain things. It may involve us or it may not.

Comment

One of the things that could come out of tomorrow's discussion is answering the question of group makeup. My guess is that this group is not a set of perfect parallels between the countries. It doesn't have the assets that the Nordic group had exactly, but that does not prohibit us from designing such a group.

At this point, the workshop adjourned for the evening, and informal discussion groups were held. The proposals that they developed formed the basis of the final day of the workshop.

PROPOSALS, CANADIAN AND AMERICAN DELEGATIONS

Dr. Howard Frumkin, USA

The seven members of the US and Canada groups have tried to formulate a list of ideas that could translate themselves into relatively short-term objectives. Our criteria for ideas were that they should have a good probability of success in the short term, they should fill a real need, they should be attractive to funders in terms of generating further support for our work, and they should be relevant to the kinds of things that the decision-makers are going to face relative to NAFTA. We are reminded that these commissions will very soon be created and we don't want to do what we're going to do, independent of the commissions. Here is a list of our eleven ideas. The twelfth is to pay the cheques, so we stopped at that point. These are mostly research questions, although some of them will turn out to be service ideas or training ideas, or both.

First, what happens when a corporation operates in more than one country? We had in mind here the fact that some US and Mexican companies will move south of the border. Do their practices change when they move? Or do they practise consistently?

Second, the question of small businesses as a unifying theme — the delivery of services to and by small business.

Third, the question of professional training. Research might look at what professional training options are available throughout the continent, in medicine, nursing, industrial hygiene, toxicology, safety engineering, etc. Where are their training or personnel needs and how might we pool our resources on a continental basis to begin to address those training needs?

Fourth, the question of worker training as distinct from professional training. What have we learned in each of our countries about successful approaches to worker training? How can materials be adapted for use throughout the continent? And so on. How can the organizations that best do worker training — most likely trade unions — be supportive in that effort?

Fifth, the general issue of information transfer about toxins and other hazards. What are the practices throughout the continent? How does WHMIS work? How do hazard communications and the community right-to-know work in the States? How might we achieve universal practices on the continent, in particular with regard to labelling, but also with respect to MSDS? As companies begin to move across national boundaries, consistency would be helpful to companies and also would help us in our work doing hazard communication.

Sixth, and there is a star by this one because this is one we got excited about and thought had promise - inspectors. The question of inspection procedures, both as a research issue, that is, looking at the even-handedness or the consistency of inspection procedures from place to place, and as a training issue, that is, looking at ways in which we could train inspectors. We were inspired by the idea of interchanges of inspectors among the countries of Europe: the idea of using existing training facilities in one country to train inspectors from others, and so on. That really could be a combined research and training agenda.

Seventh, the issue of endangered species and habitats. This came up at this point in the sequence because we realized we had been obsessing with occupational issues and should think about environmental issues also. In particular, strategically, we thought that if we wanted to pick a couple of short-term objectives, one should be occupational and one should be environmental; and so, the issue of endangered species across the continent.

Eighth, this one has a star also, an environmental star — hazardous waste. Research on how hazardous wastes are handled in the three countries, both technologically and in terms of policies. Policy development to ensure that there is

not a flow of hazardous wastes toward areas of worst practice or most permissive practices; developing strategies for hazardous waste management that are continent-wide rather than local or national in scope; and research on innovative technologies for hazardous waste management — using NAFTA as an opportunity to advance the technology that we use on the continent.

Ninth, was the question of pure water, recognizing that water will be the fluid of the twenty-first century, replacing oil, and that large areas of the continent will face water shortages. The issue of water purity and contaminants of both ground water and surface water has a research agenda for us.

Tenth, high-risk sub-populations. This is one that I proposed and it met with little enthusiasm, but I will mention it anyway. The idea here is that there are population groups, occupational groups, demographic groups or racial groups in all of our countries that are at increased risk, mostly because of excessive exposure, not to imply that there is a biological basis for the increased risk. We have focused on the experience of these groups in the US recently. This is also a very important issue in Mexico these days as well. So it really is part of a larger strategy of needs assessment. If it's the case that certain sub-populations sustain a disproportionate amount of risk, then the need for occupational health and environmental health interventions may be greatest there. Where are the sub-populations across the continent? How do we identify them and how do we handle them? There is one link into NAFTA here. If the Mexican corn industry declines rapidly, as we expect it to do, and if a large number of former corn farmers end up moving north of the border as part of an early migration north, then one of our most vulnerable occupational groups, the migrants, will increase in numbers as a direct result of NAFTA.

The eleventh and final idea that we talked about was offering an orientation and training course for new members of Congress after they are elected. We thought about offering an orientation and training course for the members of the Labour and Environment Commissions, many of whom may not have expertise in environmental and occupational health issues. They may have expertise in labour, more generally, or in environment, more generally. But we thought that, as a tri-national body of experts, we could get in early, offer training in health-related issues and hope, by doing that, to inject health considerations into the agenda of the commissions.

So those were the eleven that we came up with. The two that I think as a group we felt most excited about were numbers six and eight.

PROPOSALS, MEXICAN DELEGATION

Dr. Roberto Sánchez, Mexico

The Mexican group felt the need to begin solidifying ideas that could be discussed today, ideas that will help us to leave this meeting with a practical result. We think that one of the means to achieve this is to close in on the idea of establishing a network joining us as a group. Part of the commitment at which we could arrive today would be a national or regional module of a group drawn from the three countries, having as one of its tasks to establish a national or regional module in each country. This will enable us to start linking people with the principle of joint work.

We think that we could have several important axes for the work of the network. One would be the information exchange that might be related to a database inventory of toxic substances in each of the three countries, thinking that this information might be exchanged through the network, and having as reference parameters the name of the database and its accessibility, restrictions, public access and quality.

At the same time, it would be important to have an inventory about resources and training needs in the three countries. Included would be professional training, which could be part of an education or training program, including inspectors. It is here that we find meeting grounds with what the US and Canadian groups discussed: three of the ideas they mentioned in the list of eleven topics focus on one of the ideas that we consider important.

Another of the working axes of the network might be research, and here we could identify topics where, as a tri-national group, we could work.

Within the discussions that we initiated, we also identified that part of the process for our progress lies in our looking for a consensus about something that should enable us to strengthen ourselves as a group. Something that may permit us to project an outside image, as well as link with those groups of interest to us, whether these are NAFTA commissions, governments of the countries at any of their federal, state or local levels, labour unions or their equivalents and NGOs requiring a similar type of support as that required by the labour unions to improve their action capacity.

Some of our ideas, in terms of names, for instance, for this network, were *North American Network; Environmental and Occupational Health Professionals; North American Occupational and Environmental Health Network* — the word *network* might be omitted if there are any objections to it; *North American Environmental and Occupational Health Coalition; North American Professional Environmental Health Coalition*. Perhaps the name is the least important aspect. Physical meetings of the group would not always be necessary. Contact could be through E-Mail, fax, tripartite communications, telephone, etc.

Dr. Mauricio Hernández, Mexico

We believe that forming a group is very important. There was some discussion about whether *NAFTA* or *FTA* should be included in the name. The acronym NEOHN had also been proposed; this would signify *NAFTA* and *Environmental and Occupational Health Network*. For reasons of marketing, it should be an appealing acronym. We thought that this group could have at least four principal functions.

The organization would carry out research, but also invite others to undertake relevant environmental and occupational health research. Problems to be researched would have to be relevant to the region. By region, I mean North America, with some relevance for the continent, in the belief that this will become a global phenomenon and that many Latin American countries might benefit from Mexico's experience.

Second, it must be research that takes advantage of the opportunities being created through the decisions taken in the NAFTA context. These would be, of course, long-term products, as we all know how long any research requires. Some groups could undertake short-term work. Dr. Sánchez mentioned one, that being the database inventory, which exists already in Mexico, the US and Canada. It seems that there is a great deal of work done in this area. It would be a question of compiling that information. The same thing can be said about of the Directory of Professionals working in the area of occupational and environmental health. We already have previous work carried out by WHO and the Pan American Health Organization PAHO. Yesterday, Prof. Rantanen referred to the need to establish a group to work specifically on occupational and environmental health. To this end, a small group could be formed to carry out related positional work, in order to be able to argue strongly about what are the benefits or negative aspects resulting from the integration of occupational and environmental services under the same framework.

A third point to which the group might contribute is the development of ability, human infrastructure and technological transfer. In this connection, there are products that could be highly important: products with great visibility and potential to yield short-term results — from transferring information cards on chemical aspects developed by the EC and Canada, to short courses for inspectors. Obviously, this produces short-term benefits for Mexico, but the lesson from European countries or from the EC was that, at the beginning, there was important technology transfer toward less-developed countries, and this has introduced a certain balance. I believe that Mexico would be the party benefiting most from that information.

The fourth point regards appropriate communications, not only of the results we produce as a network, but results actively published in the field, which those responsible for decision-making never have the opportunity to read. I do not believe the *Journal of Occupational Medicine* or the *American Journal of Occupational Health* are received at the Health Department. I do not believe that

the Department bases its decisions on data taken out from such publications. One of the benefits of the network would be to digest information and present it to decision-makers through a bulletin or newsletter that we could produce.

DISCUSSION

Prof. Jorma Rantanen, Finland

Since we have established three newsletters in the field of occupational health and safety very recently — one in Africa, one in Asia and one in Estonia — we probably could offer our expertise in getting the first issues published. We don't have Spanish language, so we cannot do it on our own. But if you think it is appropriate, we could provide this kind of impetus.

Comment

There are already a number of similar newsletters, such as the one put out by the Pan America Centre for Human Ecology and Health, which doesn't appear very frequently these days, I suspect for financial reasons. But listening to Prof. Rantanen, I was thinking what perhaps we need to do is to somehow get all of these combined. We could have a common distribution list, for example.

Dr. Mauricio Hernández, Mexico

A small observation, something that might be characteristic of that newsletter, differentiating it from others and this is that there is a common bond, NAFTA. Some of the information contained in this newsletter could be used toward keeping participants, governments and decision-makers informed concerning the NAFTA process. I believe that there is no other newsletter offering this. This would help not only to fulfil the mission of the newsletter, but it would also begin to disseminate knowledge about the network and its possible benefits.

Dr. Alexandre Berlin, Luxembourg

Prof. Rantanen has said that it is not the practice at all in Finland for newsletters to use Spanish. We ourselves have a similar problem; we set up two years ago a little newsletter for the Community called *Janus*, whose purpose was exactly the same as the one you have been describing. This is, in fact, to put together, several times a year, two pages per country on the major activities and the new principles in the field of occupational health and safety. There are correspondents in each of these countries to provide information, which is centrally handled at the Spanish Institute for Occupational Health and Safety in Barcelona. Thus, the base is already in Spanish. This will probably also be one of the functions of the European Agency for Occupational Health and Safety, which will be situated in Balboa.

We have learned what features are needed by a national correspondent, and how to collect and present the information in a way that will be useful at the tripartite level of governments, employers and workers. We can certainly provide you with this, we have it, fortunately, in nine languages. *Janus* is available in all the languages of the Community, which include Spanish, English and French, and this could probably be an interesting complement to what Prof. Rantanen has just indicated. We are currently in the process, moreover, of considering whether to extend *Janus* to the countries of Central and Eastern Europe. But we can certainly offer you the models, indicating how they have been put together and possibly establishing contacts for you. I do not know the extent to which we could assist you.

Dr. Jean-Yves Savoie, Canada

We have developed, through some discussions among people at the dinner tables who got together afterward, a two-dimensional matrix. The first group, of which I was a member, tried to define a series of projects for which we will have products. Our Mexican colleagues presented the matrix a little differently, moving from information needs to training needs and research needs. I believe not only that there is the possibility of agreement between the two, but that there is also a complementarity.

I would like to make just one comment. When people get together and talk about research, the concept of research can be vast, and I think that, as a first step, I would like to use the term employed by our colleagues from France. In French, there are studies that can be defined as *descriptive studies, comparative studies, literature research or working groups*, that allow us to rapidly take stock of situations and, on the basis of knowledge that already exists, make proposals for improvement or for complementarity. And if we work on these two aspects, we are going to see that many of the Mexican proposals, if I have understood them properly, deal with much more short-term action at four levels of research; these being working groups, study groups, the development of human resources through training and, finally, databases on the entire body of environmental data.

I believe that we find these two proposals in the two matrices. I believe that we were already able to examine the eleven recommendations we have made, and beginning with those that have the highest priority, such as inspectors or hazardous wastes, to define the point where we would like to be. Are we talking about an information need for improved understanding of systems? Is it a need for information exchange? Is it a need for human resources development, or plainly a question of research needs? And perhaps we could come up with fairly concrete proposals between now and the end of the day.

Comment

It seems to me that we have heard, between the US, Canada and Mexico, a lot of commonality. The concepts are there, though they probably need juggling to make them presentable. I don't think I heard anything about which I felt uncomfortable. The network idea is a very interesting one, as is the publication idea. The issue is that we are an *ad hoc* group and we have got to think through in a relatively short period how one can indeed put such things into place. The moment we all go home, somebody has to take responsibility to do certain things, in order to make something viable. Networks work only if you have some sort of secretariat and infrastructure support. Publications cost money and people don't always have the time to put things together. We have to consider those aspects. In terms of the issue of moving to broaden from this group to others, I think a lot of our ideas would permit some steps to be taken. For example, to propose that there be a working group established to identify the training needs in North America for inspectors. We require some concrete move that could broaden our group. Also important is the issue of how this group will communicate with the commissions that will be established. I think we need to spend some few minutes thinking that through.

Comment

We have to tailor our proposals to what is possible at this point. In our group, there were a number of interesting research ideas and I think the people who proposed them ought to speak to them in a little more detail. Let me just speak briefly about the notion of working with the Commissions. I start by saying that IDRC has convened a wonderful group of experts here. There probably are some major gaps in this group. Not all the institutions or disciplines are represented, but it is a group that thinks broadly and would not find it hard to acquire the missing pieces. It seems to me that if there were a commitment of funds to design two projects, one for the environmental commission and one for the labour commission to NAFTA, that would define this group as a group of experts meeting to organize and present to the new members of these commissions a succinct course in our particular disciplines and in the issues. If there were a commitment of funds we could then make that offer and it might turn out that it is of no interest to the commissions. But it does have the wonderful advantage of putting us in communication with these commissions with a generous offer that does not carry with it any particular biases, particularly if the funding is coming from IDRC. It means a slight Canadian bias, but you are certainly seen as not representing any political point of view and I would suggest that, if IDRC could provide a little bit of commitment for the future, this is an adventure we ought to undertake, even if we do nothing else, because it will begin a communication with the people we want to be talking to.

Dr. Mauricio Hernández, Mexico

We must remember that there are two action levels on which the group might impact. One is through the NAFTA commissions. The other is through national government levels, as processes are being initiated on which we, as a group, may make an impact. Perhaps this is what is important for me, because Mexico offers a possibility to introduce changes that, in Canada or the US, may not be present. We could continue offering courses to local governments. Perhaps this would be a high-impacting step. The idea of creating a small working group was also mentioned. The pros and cons of systems integration were brought up by Dr. Rantanen. I believe that these are important for the three countries, because this is research that could contribute a great deal to the future of occupational and environmental health. I also believe that it could be another short-term benefit.

Mexican Delegation

It was also discussed that, within the task group, there would be a component with more time to think about a working agenda for this group. In other words, a group having an opportunity to come here with more time and perhaps with a sub-group of one or two individuals per country, in contact with one another, and with a proposal that could have been previously circulated, even by mail, to all of us as interested parties, as to where this might lead us. It might deal with mechanisms providing more time to think, communication mechanisms among the range of actors we identified.

Above all, we must bear in mind that we should think not only in terms of short-term actions, but also of medium- and long-term ones, if we have the opportunity to differentiate between the two. This, in my opinion, would be an important point, because many of the financing opportunities will be based on what we can offer in the short, medium and long terms. I believe that the core group is more executive and functional; the other is more theoretical, more conceptual, thinking ahead toward the future. Offers or possibilities such as these require, as well, people who can undertake the work. By cooperating together on the strategic work and process planning we could accelerate taking advantage of that opportunity.

Dr. Christopher Howson, USA

I speak from the perspective of staff at the Institute of Medicine. The Institute is ready and interested in cooperating in any way it can. Let me remind you that we are a non-federal, not-for-profit organization. What we do is to convene broad ranges of experts around specific issues, which have a scientific base, with the purpose of informing health, research or policy. With respect to future structures and strategies for this group, I believe we may need to experiment a little to see what works and what doesn't as means for addressing these in as consistent a fashion as possible across the country. One possibility would be a standing body of experts who could function for a year or more and whose responsibility it would

be to identify important new avenues for research and intervention. This body could develop means for reviewing research proposals. The group could certainly recruit consultants, as needed, for any specific issue that it wished to address. The Carnegie Corporation is right now prepared to convene a group of US funders around a document that has been prepared by Phyllis Freeman to look at border health issues, primarily in US/Mexico. It would also be interested in issues related to what's coming out around this table. From my perspective, what we would need is a document that would detail this and also perhaps some even more pie-in-the-sky moderate-term goals that I could then present to them. I think they would be very receptive and that window will close probably in another month or two.

Dr. Mauricio Hernández, Mexico

There is one point in the agenda that refers to seeking financial help, which I think we must discuss quite specifically. My understanding is that, if the group is to survive, we must have an active policy to seek financial means, and this might be included within the structure as a task for the facilitation group or for the secretariat or core group, as you suggested. Some financing offers have been received from the Mexico-United States Foundation. It is interested in forming a group similar to that being formed here, and there is interest in financing this group's activities. There is also interest in subcontracting the group to carry out certain work, such as review of proposals, etc. I would like to propose that we establish one point in the agenda to discuss financing alternatives, and perhaps we might have a final statement from IDRC and PAHO with regard to how this project is being perceived.

I could urge the participants to continue with the list, to see if we can later arrive at a decision. I was somewhat surprised when it was mentioned yesterday that there is not a serious study about effectiveness or cost-effectiveness of the inspection system. This can be a long-term project, not only relevant for the North American region, but also for the continent and even for the European Community. I believe that we must seek some serious projects concerning occupational or environmental health, as these would place us at the forefront of this type of research. Perhaps we could include, long-term item, that is, obtaining seed money to generate proposals that could be submitted to the Board of Directors or to the full network group, so as to obtain financing for those proposals. I think that we have a great open field before us, and many questions to be answered. At the top, I would put a cost-benefit or cost-effectiveness study of long-term inspection systems. Such a study would require more time, and outside contributions.

Dr. Anthony Robbins, USA

I am still looking for a means by which this group could put together one of these projects and have a sense that it was going to establish a need and a justification for some of what we are doing. It occurs to me that we are all involved in occupational/ environmental health research. We may be doing other things, but research is an important part of our lives. We can all agree that we have a vested

interest in the decisions in our fields taken by the NAFTA commissions, that we should establish, early-on, a scientific basis for decision-making and that there not be simply political horse-trading.

If that's the case, a critical question is: what is the source of stable funding for research in these fields? Let me just say that I don't consider appropriations from governments to be stable in this day and age. I think it is an interesting project to look at some examples of stable funding that have been created in the past.

The first one in the United States that I know about in the area of labour management cooperation on research was started by United Rubber Workers. The auto workers placed a similar provision in their collective bargaining contracts with the industry and, in these two examples, it is a percentage of wages that are set aside to do research. They have a joint labour and management research committee and that is how research in fact works with RFPs. It looks very formal these days. There is another tradition, in the state of Washington, and it sounds like there may be Canadian counterparts, where the worker compensation fund sets aside a portion of its revenues for the purpose of research. I believe that has its origins in legislation and we could investigate those models and how well they are working. They may be doing better at getting the money than at research. The Superfund legislation in the United States sets aside money for research. In fact, the Agency for Toxic Substances and Disease Registrars is funded through superfund money. The state of California's cigarette tax has been set aside in part to conduct research and there may be others. The second part of this study, which would do one of the things that I'm urging this group to do — that is, to set up a dialogue on almost anything between us and the new commissions — would take a look at what the research needs of these commissions might be. It may be very speculative and it may be too early, but it probably doesn't hurt to ask. I can see coming out of this a reasonable report that no one else is going to do. It would put our issues of research in this context on the map and in the NAFTA debate and it would be a worthwhile product to come out of this meeting. And I would guess that a handful of us could sit down this afternoon and take a first crack at designing such a study.

Mexican Delegation

In Mexico there are several financial sources. There is the National Science and Technology Council. With regard to industry, we have the reference of important experiences; for example, PEMEX established a \$1 million trust fund for solvent research. I think that we could find this type of financing venue.

The working group for strategy and planning process could have input vis-à-vis interfaces with funding sources. In the short-term, people may identify working niches, areas that are susceptible to being tackled by a group such as this, without having to explicitly define projects that may be undertaken over the long term and with an agenda already established. Over the short term, the agenda can be established, wherein communications may be more feasible. Such may be the

case for inspections or laboratory certification in the three countries. For example, training could be included, so that to have a short-term input would help to define a medium- and long-term agenda, instead of having a product at very long term when there is already a defined agenda. One asset of this group, considering the present circumstances, is that present financing sources may not be permanent but, in view of the present circumstances, this group has access to them. Dr. Howson mentioned, for example, the Carnegie Foundation, the World Bank and even NAFTA itself. There is a series of other groups that could provide short-term funds. Perhaps we should have more information, an inventory of those financing sources, what type of interest each serves, and whether the World Bank is interested in inspector training.

We must be careful to ensure that we don't build a wall around the North American continent and isolate ourselves from the rest of the world. It seems to me that when I look, for example, at inspection practices, the question of system integration and other issues, these are things that we ought to be doing with a view to avoiding putting ourselves in conflict with the European community or the Asian states. I can give an example: medical device safety. You know the US and Canada and the EC are now working together to harmonize our good manufacturing practice inspections in accordance with a series of standards. That is something that may be worth just a little bit of thought as we go through these things. Perhaps the broader international dimension needs some thought. I think there are some research topics that proceed from that.

I would like to speak a little about dangerous residues, our most immediate task. It is a very interesting topic that also involves other topics in your original list, such as the ethical practices of transnational companies that handle dangerous residues, the occupational exposure of workers to these residues, the presence of these industries in areas of minority groups, and technology and basic research. Even in the United States, the amount of research devoted to reducing dangerous residues is very small. This would be an important area of inquiry for Mexico.

Dr. Alexandre Berlin, Luxembourg

It seems to me that you have an advantage now in the fact that you have three organizations providing the umbrella for this meeting. This umbrella should continue to exist one way or another. If, later on, you have the funds for one organization or another elsewhere, and you do not have the continuing umbrella, you will have a project or some kind of foundation and not a joint project with the moral support of three organizations.

Therefore, I believe that, for the moment, you have no interest in striking out on your own. I also believe that the results of this work and whatever proposals come forward from this group should be under the umbrella of the three organizations.

Dr. Mauricio Hernández, Mexico

With regard to logistics in our meeting, perhaps it would be a good idea to think in terms of three breakout groups encompassing each of the three components, because if each group covers the whole agenda, it will be difficult to reconcile actions among the three. I would then propose that one group work on structure, another should work on expanding short-term objectives and the third on long-term objectives. If there is sufficient work for a fourth group, perhaps we should create a task force to think what really are the objectives of this network. The other problem of having a fourth group is that we are very few.

Comment

We must remember that an impact can be achieved only through the government of each country. I would like to suggest that offering courses to local governments might also produce a fairly substantial impact. While there were short-term actions such as these, the desire was also expressed yesterday for groups with more time, for example, to elaborate agenda proposals for whatever it is that the group determines. This would allow a more diversified approach, although aimed at short-, medium- and long-term actions in linking strategies, both with the Commissions and with local governments.

It has also been emphasized that there were other important factors. These may be the labour unions, NGOs, capital groups, industrial groups, etc., that nevertheless are or could be interfacing groups with which we could work. Those groups require the information that this team could provide.

Comment

It seems to me that there are two concrete proposals on the table at the moment. One is to decide upon two research projects, one predominantly occupational, one environmental, and the other is this idea of a newsletter or larger publication. I think both ideas are good and are not mutually exclusive. I very much like the idea of a publication because it can bring together and reach the largest number of people. It would reach not only colleagues but would, if done in a professional manner, be impressive to the commissions, very visible, and achieved in a very short period. So, I would not like to think of abandoning this idea while we develop the research project idea further.

Dr. Alexandre Berlin, Luxembourg

Something that, perhaps, will require the least work from you is, in fact, this inventory of databases, with a minimum level of information on what it contains and how it can be accessed. This is also something that would probably be very useful for the members of these commissions in relation to the information on the base infrastructure of the other two countries, which the members will not have. Thought must be given to what one will risk having as information and,

conversely, what one will risk not having as information. Certainly, I think that the Canadian members are very familiar with what data banks there are here. And, equally certain, they know less of what data banks there are in the other countries and vice versa. And this is, in my view, an immediate and highly complex advantage, which does not require a lot of money, and which can be perhaps a source, perhaps a more useful approach vis-à-vis the members of these commissions as a first step, rather than offering them a training course before you know who they are. Because perhaps you will discover that they are very well trained and that the course that you offer them should take into account the training they already have received and from whom. On the other hand, offering them an inventory of databases — please note an *inventory* of databases — is a neutral thing, more neutral than saying to them: "We are going to train you." There is a need to be cautious because they can be sensitive.

Dr. Mauricio Hernández, Mexico

Going back to the idea of beginning to put proposals on the table, I should like to say that, actually, there are several working lines. A very concrete proposal is that research might be bibliographic, based on databases existing in the three countries. Another has to do with short-term courses to be offered to the commissions or governments. The third lies in creation of a working group to produce a complete review of the two systems (occupational and environmental health) and to decide whether they should be joined in the research. The research side of it can be directed at longer-term aspects of cost/benefit of inspection systems, as well as participation by the labour unions. On the other hand, we have the question as to how we are going to operate and on whose account. I believe that this is important to decide.

How are we to operate as a network? Is it going to be as a committee or will be on an open membership basis and who is going to be our main information user: the commissions being created through the NAFTA, local governments, companies, public health workers or even the working population in general? From this stem actions and research proposals.

As for the newsletter, I could propose that the Institute should facilitate this. The Institute has some experience in newsletter publishing, in English as well as in Spanish. Although no means are available to do so in French, I think we could count on the help of colleagues, and this could be done at a relatively low cost. One of the advantages of NAFTA is the low salaries prevailing in Mexico.

Dr. Jean-Yves Savoie, Canada

Currently, we are working at two levels: on the form and on the content and we are moving systematically from one to the other. And if you will allow me, I would like to say that, when I came to the present group I was under the impression that it was a formal meeting and that, during this meeting, a group of specialists — since I believe that to a certain extent we are all specialists — would present a

certain number of concrete proposals with two objectives. The first objective would be to attract the attention of the people directly involved, that is the commissions, and the governments. The second objective, would be to propose some feasible, simple things that could be funded by one organization or another that would find something to interest them.

Comment

I think our role is to bring together occupational and environmental health professionals in the three countries in order to identify opportunities that will lead to better conditions for workers, improved environment, and so on. It is naive to think we are going to influence the trade union movement or environmentalist groups. They have much better ways to link with each other and much more effective means of figuring out what it is they want to do. We're occupational and environmental health professionals. We can influence the commissions, that is true. However, I don't think our primary objective is political. We don't exist as a lobby group to the commissions. I think we can be very concrete as to feasible products. It seems, from the various comments around the table, that adequate funds can be raised fairly easily. I am talking about this newsletter idea, with very specific items in it, as a first step. What I see concretely is an editorial on occupational and environmental health opportunities under NAFTA; columns on regulation and legislation; comparative analysis; standards development -- the state of the art in the three countries; professional development; current environmental events; workplace events; and what's new in the scientific literature. A ten-page newsletter could be produced in all three languages. I just jotted down these ideas, they are not necessarily the be-all and end-all. Who would receive the newsletter? Existing networks, such as GNET, that WHO has put together. We can make a list right now of 200 occupational and environmental health professionals in the three countries who would love to receive such a thing.

Dr. John Markham, Canada

I would just like to remind everybody that IDRC does not own this project. It's a collaborative project between IDRC, the Institute of Medicine of the National Academy of Sciences and the National Institute of Public Health in Mexico. We are all part of it. However, IDRC wouldn't have played a role if it weren't very interested in furthering it and we are a granting agency.

Dr. Roberto Sánchez, Mexico

One of the topics about which we could collect information in the three countries and make accessible to the NAFTA commissions is standards to harmonize laboratories in the three countries. We should start to identify two or three things, and determine whether there is a commitment or intention by some voluntary participants to start accepting responsibilities.

In principle, I could accept responsibility for working with some colleagues, on Mexico's behalf, on the database question: to compile information about what is available in Mexico, make a summary, and make it available to Canada and US.

Comment

We can divide our current activities into two areas. One is building infrastructure, building our network, establishing communications, exchanging information process issues. The second is identifying and undertaking work on specific projects. There is a lot of interest in sharing information on exposure databases in laboratory practices. A lot of the information exists already. It is not as if it is a major research effort to pull it together and I am taking the liberty of categorizing those goals under *sharing existing information*. If there were a steering group of a few people who could simply take it on themselves to identify existing exposure databases in OECD agreements on laboratory practices and distribute those, that job would be done. So we would look at part of our infrastructure or our process as being information-sharing. That would confirm a goal that we have articulated. In addition, I like the idea of making contact with the commissions, probably in the form of a letter from IDRC, IOM and the National Institute of Public Health to report on the fact that we have met, to explain our plans and to make that contact. I would view all of that as infrastructure-building.

Comment

The representative here from PAHO says she would be prepared to entertain the idea of taking back to her organization the recommendation of infrastructure support for some activities in the interim, which might bring together a sub-committee of this group and, possibly, this group together at a later stage, but to put in place or to seek funding to get certain projects under way. There may be others around the table who are prepared to consider the possibility of going back to their organization to seek monies for certain projects. It is important to hear about those initiatives and to consider whether approaching PAHO might be in order.

Comment

I would like to propose an organizational system. There should be a steering group, made up of representatives of Mexico, Canada and the US. The number of members from each country might be two, or one, in order for the meetings to be as inexpensive as possible. The group should have a chairperson and, connected to this steering group, there might be a facilitating group of technical people helping to publish the newsletter, to develop proposals, organize meetings, take responsibility for editorial content and publication of reports, as this is work requiring great care and attention. In my experience, report presentation has a definite bearing upon the impact, which sometimes is greater than its content.

There should also be a group involved in production of some type of information, as participants in a working group, as writers, or as participants in a long-term research project.

Finally, there are potential members from the working community, government agents or companies, who can be invited to participate in the network. I believe that, in this dynamic organization, a certain fear exists about long-term commitments, because all of us have professional lives to attend to, and because we are all subject to other pressures. These participants can be very active, or not so active, limiting their activities simply to the newsletter, for example. However, this newsletter will have a significant impact.

As to who the beneficiaries of the newsletter will be, I think that they have been identified already. These would be the NAFTA commissions and government officials who are making decisions in each of the three countries. We could also include companies, labour unions and the community.

Dr. Roberto Sánchez, Mexico

With regard to the infrastructure topic, I should add "sharing existing information" to what we are presenting in terms of available resources for training and other requirements. That is to say, whether the University of Manitoba has a Master's program in occupational health, or if the University in Winnipeg, for example, has a special environmental health program, or if the University of Wisconsin specializes in training inspectors. It would sum up what is available in each of three countries; what are the requirements of the three countries; if, for example, the Province of Manitoba needs 25 inspectors per year, or if California requires 50 inspectors in the next five years.

With regard to occupational health, there is not much access to databases handling this type of problem. There are many deficiencies, from personnel training up to and including human resources in this field. For example, even if Mexico ratifies Convention 161 regarding installation of health services in the workplace, it really does not give a 180-degree turn. This is an aspect that has been left aside in Mexico. There are few people who have concerned themselves with this problem, so much so that in all legal reforms, the occupational aspect is basically left untouched. In the environmental field, there is a greater budget for this for there are more people, including non-governmental groups, very interested in this. Unfortunately, labour unions do not apply important and active pressure. For professionals devoted to this field, or trained in this area, there are not sufficient elements or information to table a concrete proposal allowing a 180-degree turn of the focus toward occupational health.

At this point, the meeting broke up into 3 groups.

REPORTS FROM GROUP DISCUSSIONS

INFRASTRUCTURE AND FUNDING GROUP

Two financing sources were identified or two types of financial support. One of these would be dedicated to structure, which we would call *core funding*. The other would be earmarked for research projects. As to the manner in which the group would operate, the following proposal is made. There would be a series of members active in the network, who may be, principally, researchers in the field of occupational and environmental health, and who are carrying out some work within the network. As guests and observers, it would be a question of inviting representatives from professional organizations, financing agencies and, if at all possible, government members having decision-making power. From this pool of active members, especially from the researcher pool, a steering group would be selected with perhaps six people, some of them from the three institutions. Within this steering group of six people, there should be a Canadian representative from IDRC, a representative from Mexico's National Public Health Institute, and a representative from the Institute of Medicine in the United States. To these three people would be added one person or more per country. It may be done through an election process. We did not get down to discussing the mechanisms. These three persons would be balanced between occupational and environmental health to ensure that the two aspects are supervised. From this steering group, a chairperson would emerge, appointed for a two-year period. This position would alternate among the three countries.

Depending on the steering group, a facilitating group would have to be financed, that is, a core group whose main activities would be to develop the newsletter and communications among the network members, while seeking funds to support the group. It might also participate in development of research proposals, whether in terms of research agendas or by technically helping with development in fields of interest. Also, the facilitator group would receive instructions from the steering group to undertake the pertinent contacts with the commissions and national governments. This is very important, because there must be personnel permanently devoted to the network's activities. This is fundamental because the steering group as a rule has other activities, and its participation in operational aspects would be compromised.

We did discuss the idea that the three agencies were going to look at ways in which there might be some sort of pooling of money, which would then facilitate having a mobile secretariat, the idea being that, if one tied a specific project to a country, there might be the need to move the secretariat around in order to accommodate local desires within the three countries.

It was proposed that for the first two years, the facilitation group should be in Mexico or Canada, because of the ease in obtaining funds in these two countries. However, Dr. Howson was mentioning that it might also be important for the

facilitating group to be in the United States, in order for this to be perceived as a more balanced situation, considering that within the US community there is a perception that NAFTA's benefits are 90% for Mexico and 10% for the US.

We had agreed that the group would be rotated, but because there is not yet free circulation, it should be made up of nationals of the country where the facilitator group would be situated. If this group is situated in Mexico, the facilitating group should consist mainly of Mexican nationals. If it is situated in the Institute of Medicine, it would consist of Americans, and if in Canada, it would be made up by Canadian nationals. There would be some contributions from the steering group, given the fact that the facilitator group would be the operational arm of the steering group.

DISCUSSION

Comment

I have heard people raising the question that if we go with the facilitation group, which involves just one country, then we have some problems. It seems to me that it's perfectly possible to have a facilitation group where a lot of the work might be done in a particular country, but where contact is maintained between the members.

Comment

I think, operationally, that status is difficult to achieve. The facilitator group is not going to make decisions. It will only implement whatever the steering group decides, and it is there where the tri-national representation resides. I think that the facilitator group must be concentrated within a country and carry on all its activities there. Otherwise, it would become less efficient. To guarantee that in the group there will be Mexicans, Canadians and Americans is very difficult because of labour considerations.

Comment

I am somewhat concerned that this facilitator group be only from one country, because it cannot represent a common viewpoint. Even if it does not have a decision-making capacity, it can represent a viewpoint that will not necessarily be shared by the other countries. This may mean that the work invested in a financing proposal, or a communication project, or any other activity, may reach the decision stage without representing a tripartite or commonly held interest.

I do not believe that the facilitator group needs to reside physically in the same locale. Rather, I think that it should have a permanently open communications channel, through E-Mail or any other mechanism. There is also a problem of projecting an image to the outside. If the facilitator group were in the US, some misgivings may be aroused in Mexico or in Canada.

Comment

If such a board were established, our recommendation would be that IDRC and the Institute and the Mexican government representative would be in a position to contact, within their countries, other members of this group to ask them to participate as part of that executive and that their group would be able to proceed with finding funding and moving to identification of facilitation groups to deal with these various issues.

Comment

We should not be overly concerned about the representativeness of the facilitator group, because this group will not make any decisions. It will undertake tasks required by the steering group. The idea of having it concentrated in a single place is simply operational, and to provide for efficient use of resources. We propose that the facilitator group be rotated among the three countries: two years in Mexico, two years in the United States and two years in Canada. But if we identify the facilitator group as a body that will undertake responsibility to perform tasks, it seems to me that an extra problem, that of communicating among the three units, will be created if it is entirely fragmented.

Comment

This separation into 3 national coordinating elements may be helpful, provided it takes the leadership for a given series of tasks.

RESEARCH GROUP

This is a proposal to compile and analyze databases in occupational and environmental health. We identified four kinds of databases that would be useful: one on exposures, one on health outcomes, one on professional training programs, and one on the availability of laboratories — both labs to look at environmental samples and labs to look at biological samples relevant to occupational and environmental health. After identifying the databases that exist, we would want to evaluate the strengths and weaknesses, according to defined criteria. Finally, we'd compare, analyze and issue recommendations.

In terms of method, first we would do country-specific data collection. There would be a team from each country to collect data. Mostly, these are lists that have already been assembled, so the idea is to find the lists that are out there already. We thought that it was beyond the scope of the project for us to be assembling lists. We will have a list of available databases in each country in each of the categories listed. That's done by country-specific teams. Then, the teams come together to compare what they have found. In step three, we analyze data, identify where there may be opportunities to improve resources in one country, based on resources in another country, where there may be needs across the board that we should fill. Our thought was that the environmental exposure databases can be gathered and a product generated quickly. Doing the full undertaking requires a lot more time and resources and we would need to develop a time frame. As for budget, the costs are relatively low to begin with. This would involve the country teams calling around to people that they know in their countries to see what's available in getting it. The step - two cost and the step - three cost are a bit higher because they'll include some travel, as well as transcription and report preparation.

DISCUSSION

Mexican Delegation

I should like to see whether it is possible to include a fifth point that arose from the discussion at our table. It is a directory of professional organizations that are certifying workers in Canada and the United States. In Mexico, there is not as yet an institution certifying industrial hygiene specialists or occupational health workers. This is important because, in Mexico, following the signature of NAFTA, professional organizations will have an important role in certifying professionals, physicians or health workers.

If we are to operate as a network, projects should be submitted to the network steering committee, the network assigning the funds that IDRC or other institutions undertake to provide for research. Otherwise, financing outside the network becomes more complicated.

Comment

When you are putting together your final version, might you give some consideration to some external peer review group that bounces the document off associations or others, to make sure nobody is missed out and you have some sort of formal external comment?

PROJECTS GROUP

We thought it was important to identify one or two issues that would be of particular significance and relevance to the commissions. In the course of these three days, we have listed a whole variety of topics that could be addressed and we hope that they are all included in the report that comes out. Here are two that we thought we might be able to flesh out in a little more detail. One deals with an environmental issue, which is hazardous waste, and the other deals with an occupational issue, which is inspections. Hazardous waste is a big issue here. We discussed development of uniform tracking systems for hazardous waste across the three countries. The second idea was a project that would look at on-site waste minimization practices by the industrial sector. Perhaps we would pick one industrial sector and do a descriptive study. For example, how industries using solvents are doing waste minimization on-site in the three countries. A third idea was to look at regional approaches to hazardous waste management and, in that vein, we could, for example, look at how each country makes siting decisions around waste management facilities. We could think about the harmonization of risk assessments for siting hazardous waste facilities. Finally, health effects -- including psycho-social effects -- around hazardous waste or the siting of hazardous waste facilities.

There were many good ideas around the table about occupational health issues and the one that our group picked to focus on was the whole notion of inspection. We didn't flesh out a proposal, but we had numerous ideas, including looking at different inspection practices in the various countries or states or provinces, looking at training of inspectors, possibly working toward development of inspection standards. This is the one we think we would start with.

We felt we couldn't outline a grant proposal at this point. But we had several ideas of how one might be able to proceed. If we took, for example, the occupational health inspection issue to begin with, we'd convene a small steering group that would try to write up a request for proposal to one of the funding agencies. But we wondered if that was fair, because many of us would like to write that proposal and be funded to do that kind of work. And so we weren't really sure if that was the right way. We don't want to be competing with each other. Instead, we thought it might be useful to have the group come together and write a request for proposal that, perhaps, IDRC or another funding agency could put together and send out.

Then people who want to bid on that proposal, to do that research, whether it's a team of us or a team of others, could bid on the proposal to do the research. There would be a small trilateral group that would come up with the outline for the proposal. That would include even, for example, a brief qualitative background statement on why this is an important issue. Why do we have a proposal? Why are we asking for proposals on inspections? It is possible there could be two

requests for proposals. The first one would be, for example, to do a complete background assessment of current inspection practices in the countries. And then the second proposal could be, for example, some sort of intervention.

DISCUSSION

Comment

As far as I am concerned, the application process involving proposals requires too much time. The idea of having a group such as this is to shorten research and financing times. The list presented seems to me very interesting, having a great potential benefit, if we analyze it in detail, especially the area of dangerous substances registration systems throughout the three countries. That, I believe, would be a positive contribution, if we could harmonize it. I also consider inspection systems relevant.

I think that the idea being presented here is very interesting. I should like to remind you that among the themes suggested for this third group, was the creation of a long-term research agenda, including communication or participation with the different government levels, NAFTA institutions, and with other actors.

SUMMATIVE COMMENTS

Dr. Alexandre Berlin, Luxembourg

It was difficult, when this agenda was put together, to see what were the points that we, as observers, could usefully contribute at the end of your discussions. You have really reached what seems to me a reasonably good working mechanism, particularly the idea of thinking in terms of a tri-national view. You have accepted that the three institutions together act as an umbrella group. You have realized that a channelling mechanism through the three organizations together will be a much more productive way of working together, since whatever proposal you will make will consist of the groups from the three countries. In one way or another, you will have to establish a coalition between yourselves for any proposal. In the European Community, we find that requests for funding receive a much more favourable view if they come from a joint committee of at least three countries.

You have also identified two important areas of focus. Hazardous waste is now a major problem in Europe. It is also an important issue from an occupational health point of view. Not that long ago, we did a rather extensive study on the problem of hazardous waste and workers. We can certainly make it available to you. With respect to labour inspection, as I told you already, we will try to make all the things we have done available to you.

We also have a joint report on how the systems work in the various countries and how we try to put everything together. You might wish to use it as a model, or decide not to use it for a number of good reasons. You might also wish to draw on expertise of the working group of senior labour inspectors.

Mexican Delegation

I would like to underscore a very interesting point, which I must admit I didn't know. When writing the proposal for inspection standards, the background data from each country must be available, and in gathering this information, background information from each country for inspection purposes is going to be very useful to the commissions. For example, I learned that each Canadian province follows its own inspection practices, and that in the United States each state does likewise. Having this background information would, in itself, be a great product for this small group.

Dr. Graham Gibbs, Canada

Dr. Tennessee had offered that the PAHO would act as the secretariat or would provide a secretariat. We discussed that question and the feeling was that we needed to maintain, within NAFTA, the idea of having an institution situated in each of the three countries. I think everybody is very grateful for the suggestion and offer and we will knock on PAHO'S door for monies and all sorts of initiatives. So there is no rejection of PAHO's role, PAHO should be part of the process but I think the idea of keeping the three-country concept is a cardinal point.

Prof. Jorma Rantanen, Finland

Dr. Berlin already did a very good summary but let me conclude on my side. We started by making an inventory of the problems of occupational and environmental health in different countries and a little bit also in different regions. We identified the new challenges that are going to be faced in view of integration and also in view of general developments of working life, globally, regionally and nationally. We identified two types of new developments. First, extremely demanding challenges, such as new technologies, which are not always friendly to occupational and environmental health. Finally, the demographic changes will be rather dynamic and remarkable and they are going to challenge environmental and occupational health substantially. We also analyzed the structures available in different parts of the world for meeting these problems.

We identified the needs of the countries in this particular area and we got very good reports from Canada, the US and Mexico concerning the present and future needs of occupational health and environmental health. Then we moved to definition and identification of possible objectives for future collaboration. I think they were very clear and, fortunately, not too numerous. One was to create a network within the expert scientific community in this field and in this NAFTA framework. Another was to provide, if possible, appropriate, competent advice for

commissions or governments collaborating in these two fields. What probably was not very clearly spelled out was that the ultimate objective is, of course, improvement and equalization of working conditions and environmental conditions for all populations in all countries. I would like to warn again about the possibility in the developing world of social dumping. Finally, you discussed very effectively the actions that should be taken: a steering group, collection of data systems, and long- and short-term research projects.

Comment

I propose that the steering committee look for a name for us, and the other is that Dr. Rantanen and Dr. Berlin's services be retained as outside advisors to the steering committee.

Mexican Delegation

From the perspective of the National Public Health Institute, I believe that, for us, this meeting is very important. We have tried to promote environmental and occupational health many times — and were always swimming upstream. This group opens new possibilities and gives us the chance to consolidate an institutional project that we have been handling for some years now, which we consider of vital importance.

I like very much Prof. Rantanen's vision, because he has the ability to find an accommodation between occupational and environmental health systems at the world level, while trying to reduce disparities in and among countries. Needless to say, this is a long-term objective.

At the beginning of this meeting I said that the advice of all of you was required in order to end up with a relevant product, a product that might be carried out. And now I wish to thank you because I am convinced that we will have such a product.

Frequently Used Acronyms

\$ CAD	Canadian Dollars or Equivalent
IOM	Institute of Medicine (USA)
EC	European Community
IDRC	International Development Research Council (CDA)
NIC	Newly Industrialized Countries
OECD	Organization of Economic Cooperation and Development
WHO	World Health Organization
ILO	International Labour Organization
WHMIS	Workplace Hazardous Materials Information
MSDS	Material Safety Data Sheets
ACGIH	American Conference of Governmental Industrial Hygienists
FINNDA	Finnish Department for International Cooperation
TOSCA	Toxic Substances Control Act
CSST	Commission Santé et Sécurité du Travail (Québec, CDA)
IRSST	Institute de Recherche Santé et Sécurité du Travail
CCOHS	Canadian Centre for Occupational Health and Safety
CEPA	Canadian Environmental Protection Act
IMS	Institute of Medical Science
ISO	International Standards Organization
CONACYT	National Council for Science and Technology (Mexico)
IMSS	Mexican Institute for Social Security
EPA	Environmental Protection Agency
OSHA	Occupational Safety and Health Administration (USA)
NIH	National Institutes of Health
NIOSH	National Institute of Occupational Safety and Health
ICOH	International Commission on Occupational Health
NGO	Non-Governmental Organization

**JOINT WORKSHOP TO DESIGN A COLLABORATIVE INTERNATIONAL STUDY ON
OCCUPATIONAL AND ENVIRONMENTAL HEALTH SYSTEMS IN NAFTA**

*THE INTERNATIONAL DEVELOPMENT RESEARCH CENTRE
250 ALBERT STREET, OTTAWA, CANADA*

Monday, March 28th 1994

Plenary Session - Board Room, 14th floor IDRC

9.00 a.m.

Steering Committee: Drs. Mauricio Hernández, Chris Howson, John Markham
Introductory remarks, dealing with housekeeping items, testing translation equipment, outlining expected outcomes, explaining the plan for the meeting.

Welcome to the Delegates: Dr Gilles Forget, IDRC
Director of the Health, Society and Environment Program

Dr Jorma Rantanen
Director, Finnish Institute of Occupational Health

World Models of Occupational and Environmental Health Systems

10.30 a.m. Refreshment Break

11.00 a.m. Discussion, led by Dr Rantanen: The relevance of world occupational and environmental health systems models to the forthcoming free trade situation in North America

12.00 Lunch break

Overview of **National Occupational and Environmental Health Systems presented by the national groups, with major areas for research highlighted:**

1.00 p.m.

The Canadian System - followed or accompanied by questions and discussion

Refreshment break

3. p.m. **The Mexican System**, with questions and discussion

Tuesday, March 29th 1994

9.00 a.m. **The System in the U.S.A**, with questions and discussion

Refreshment break

10.30 a.m.

Dr Alexandre Berlin, Adviser to the Health and Safety Directorate, European Commission

Experience with harmonisation of Environmental and Occupational Health systems in the European Union

12.00 Lunch break

The coordination of 3 parallel research teams investigating the national systems of occupational and environmental health.

1.00 p.m. **Broad Research Structure**

(A) Should occupational and environmental health be considered as a unity, whatever variety of agencies or administrative patterns may exist?

(B) What matrix or matrices should be used?

(C) How broad a scope can be attempted and related to various time frames?

2.30 p.m. Refreshment break

3.00 p.m. **Research strategy**

(D) Should existing systems be investigated within specific industries, using the same ones in each country? or should it be done on a national "canvas", or should some parts to be done in specific industries and the others nationally?
If in specific industries, which ones?

Wednesday, March 30th 1994

9.00 a.m. Discussion of key operational issues

Issues for discussion will be selected and decided by the delegates; Examples: Enforcement of regulations -is research feasible concerning the determinants of adequate but tolerable enforcement, or into methods of providing an optimal approach to enforcement?

Which research areas are of highest priority? Where are the major collective weaknesses, information gaps and inconsistencies? (e.g. is it in needs for capacity building in occupational and environmental health?)

10.30 a.m. Refreshment Break

11.00 a.m. Is political receptivity to act on research results greatest in the short term soon after the Agreement? If so, can results realistically be available in a relatively short time frame and if so in what areas should this be aimed for?

What funding agencies are likely to be willing to be involved, and in what areas of research?

12.00 Lunch Break

1.00 p.m. What researchers are likely to be available for various types of research in the 3 countries?

2.00p.m. Summative Comments from Dr Alexandre Berlin

2.30 p.m. Summative Comments from Dr Jorma Rantanen

3.00 p.m. Closing comments from the Steering Committee

APPENDIX



COMMISSION OF THE EUROPEAN COMMUNITIES
DIRECTORATE GENERAL
EMPLOYMENT, INDUSTRIAL RELATIONS AND SOCIAL AFFAIRS

Health and Safety Directorate

Luxembourg, 22 April 1994
CEC/V/F/LUX/14/94
REV-1

***Occupational and Environmental Health and Safety (Chemicals) in the
European Union***

***by Alexandre Berlin, PhD & William J. Hunter, FFOM MB BS
Adviser Director LRPC MRCS***

***Health and Safety Directorate
European Commission
Luxembourg***

***International Development Centre Workshop
Ottawa, March 28th to 30th 1994***

1. Introduction

The last few months have seen the coming into force of two major treaties: NAFTA and the Treaty on European Union.

Both these treaties are built on past experience, NAFTA on the Free Trade Agreement between the USA and Canada, and the Treaty on European Union on a number of previous treaties, the first one of which dates back to 1952.

The building of the European Union has been a slow and gradual process. The first Treaty, the European Coal and Steel Community with six Member States was signed in Paris in 1952. It was followed in 1957 by the Rome treaties on the Economic and Atomic Energy Communities.

In 1967 the Executive Agencies of the three treaties were unified into a single Commission of the European Communities. In 1987 the Single European Act amended the three treaties, by extending the competence of the Community and introducing new obligations. Finally in 1993 the Treaty on European Union, which by now had twelve Member States, was an additional major step in the process in creating an ever closer union among the people of Europe, a Europe in which decisions are taken as close as

possible to the citizens. It is in this context that two key principles were introduced: proportionality and subsidiarity.

The European Union is much more than a single market for goods and services. The free movement of workers is already a reality, soon to be followed by a total free movement of people without any border controls. The establishment of a citizenship of the Union will have its first practical application for the election of the European Parliament of 12 June 1994; an article of the Treaty on European Union provides that any citizen of the Union residing in a Member States of which he/she is not a national may exercise a right to vote and to stand as a candidate in election to the European Parliament in the Member State of his/her residence.

As the European Union goes beyond a single market, this has major consequences on a number of practical rules that have to be established. In the field of Chemical Safety the primary concern under the 1957 Treaty establishing the European Economic Community had been to avoid commercial and administrative chaos and to prevent the building of technical barriers to trade.

The European Single Act of 1987 provided for the possibility of legislating at the European level for both environmental protection and the protection of the health and safety of workers. The Treaty on European Union of 1993 extends the competency of the Community to public health and directs that other Community policies, such as agriculture, transport, taxation, etc take into account the environmental and public health dimensions.

To ensure the proper functioning of the European Community in terms of decision making process, application of the Treaty, continuity of actions and transparency, a number of independent but interrelated Institutions have been gradually established.

The main Institutions, and their respective roles, are:

The Commission of the European Communities

It ensures the daily functioning of the Community, checks on the observance of the Treaties, and has the right to initiate proposals.

The Council of Ministers

Representing the governments of the 12 Member States, it adopts Community legislation on the basis of Commission proposals.

The European Parliament

The Commission is collectively answerable to the Parliament whose members are simultaneously elected in the 12 Member States.

It has co-responsibility in the adoption of certain Community legislation items, and a final say on the budget.

The Economic and Social Committee and the Committee of Regions

They represent respectively the interests of the Social Partners and of the many regions of the Community; they have consultative role.

The European Court of Justice

Handles all the cases involving disputes in the application of Community legislation by Member States, or individuals and disputes between Member States.

The European Court of Auditors

It audits the spending of the Community, but it also audits the national accounts of the 12 Member States with respect to VAT and import duties, to ensure that the Community receives the appropriate funds.

The interactions between these institutions in the decision making process established by the Treaty on European Union (1993) are set out in Figure 1.

2. Importance of the Chemical Industry in the European Community

The chemical industry often considered as the main culprit of environmental degradation, is also an important source of wealth. In industrialized countries this industry represents between 5 and 10% of the gross national product.

Chemical production in the European Community represents 28% of the world production (23% for North America and 15% for Japan). In 1988 the turnover reached over 400 billion Canadian dollars for the Community as compared with 310 for the USA and 200 for Japan. The importance of trade, both intra Community and extra Community, for the chemical industry is illustrated in Table 1.

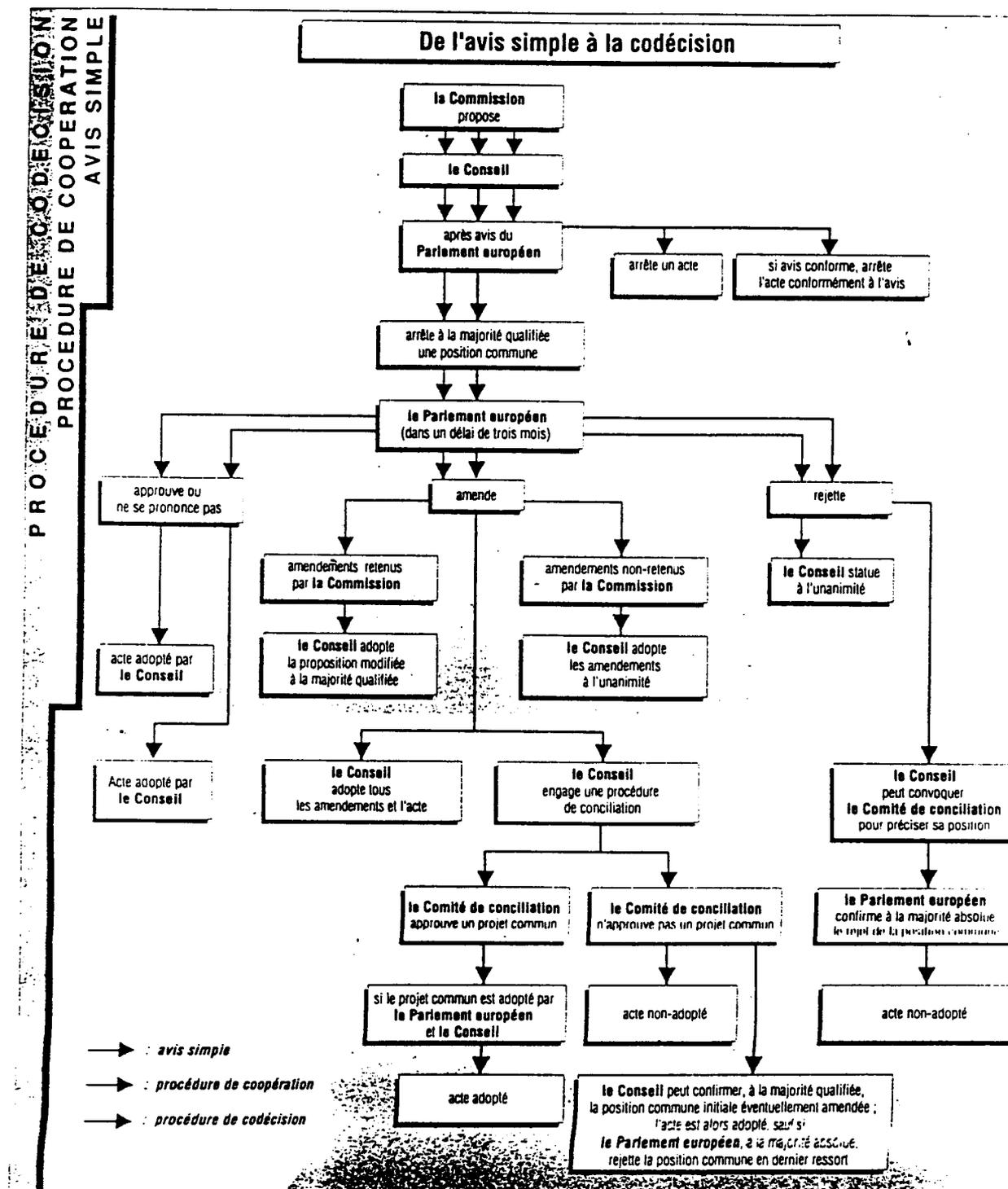
Table 1

Chemicals and Trade (1988)

Intra Community trade	73 billion ECU
Extra Community exports	51 billion ECU
Extra Community imports	27 billion ECU
Positive trade balance for chemicals	24 billion ECU

At least 9000 chemical companies operate in the EC. Seven of them are among the 10 largest chemical companies in the world. These are BASF, Bayer, Hoechst (all three German, ICI (UK), Shell Chemicals (UK/Netherlands), Montedison (Italy), Rhône-Poulenc

Figure 1 Decision Making Process



Avec la procédure de codécision, instaurée par le traité de Maastricht (article 189 B), le Parlement européen détient le pouvoir d'arrêter des actes conjointement et sur un pied de quasi égalité avec le Conseil. La codécision s'applique aux domaines suivants : marché intérieur, libre circulation des travailleurs, liberté d'établissement, reconnaissance mutuelle des diplômes, accès aux activités des salariés - ainsi que certains domaines de compétences nouveaux ou renforcés (cf. tableaux pages 4 et 5).



(France). The chemical industry in the Community employs over 2 million workers, to which must be added the more than 1.0 million workers employed in the ferrous and non-ferrous ores and metals sector and the 1.5 million workers in the non-metallic minerals and mineral products.

3. Treaty basis for regulating

In the 1957 Economic Community Treaty the regulation of chemicals could only be for the purpose of removing technical barriers to trade. Health and safety at work and environmental protection have been given a formal basis in the Treaty by the Single Act, and the Treaty on European Union has done the same for public health.

The Treaties permit the establishment of unified Community legislation in the form of Regulations, Decisions and Directives.

The Directive is the preferred instrument for legislation relating to the environment and to health and safety at work. It lays down the objectives, sometimes in great detail, while leaving to Member States the choice of the means for achieving them, although there is an obligation to produce results. Member States even if they voted against the texts when they were adopted (qualified majority), have to transpose them in national legislation and implement them.

Three articles of the Treaty are relevant to chemical safety, namely Article 100a, concerning the harmonisation of legislation for establishing the internal market, Article 118a, concerning health and safety at work, and Article 130r (and s) concerning the environment. In addition Article 129 on public health, and Article 129a on consumer protection will certainly have an impact in this field in the future.

The term internal market is defined in Article 8a of the Treaty as follows:

"The internal market shall comprise an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured in accordance with the provisions of this Treaty".

With regard to the harmonisation of legislation for the establishment of the internal market, paragraph 1 of Article 100a states that:

"The Council shall, acting by a qualified majority on a proposal from the Commission in cooperation with the European Parliament and after consulting the Economic and Social Committee, adopt the measures for the approximation of the provisions laid down by law, regulation or administrative action in Member States which have as their object the establishment and functioning of the internal market".

Paragraph 3 of this article states that:

"The Commission, in its proposals envisaged in paragraph 1 concerning health, safety, environmental protection and consumer protection, will take as a base a high level of protection".

This third paragraph is fundamental because, in principle, it is not possible for Member States to adopt stricter measures than those laid down in Community legislation.

The key example relating to atmospheric pollution is that of vehicle exhaust standards, where trade between Member States - free movement of goods - must be ensured.

In exceptional cases, for reasons of public health, protection of the environment and of the working environment, derogations may be granted after the Commission has verified that they do not constitute a means of arbitrary discrimination or a disguised restriction on trade between Member States.

With regard to health and safety at work, Article 118a of the Single Act applies a different philosophy.

The objective of the Community approach in this matter is set out in paragraph 1 of this Article, which lays down that:

"Member States shall pay particular attention to encouraging improvements, especially in the working environment, as regards the health and safety of workers, and shall set as their objective the harmonisation of conditions in this area, while maintaining the improvements made".

Paragraph 2 of the same Article stipulates the procedures for achieving this objective:

"In order to help achieve the objective laid down in the first paragraph, the Council, acting by a qualified majority on a proposal from the Commission, in cooperation with the European Parliament and after consulting the Economic and Social Committee, shall adopt, by means of directives, minimum requirements for gradual implementation, having regard to the conditions and technical rules obtaining in each of the Member States".

Given the potential difficulties for small and medium-sized undertakings, the development of which is given a high priority in Europe, the same paragraph also lays down that:

"Such directives shall avoid imposing administrative, financial and legal constraints in a way which would hold back the creation and development of small and medium-sized undertakings"

Finally, paragraph 3 of the Article contains an additional key element:

"The provisions adopted pursuant to this Article shall not prevent any Member States from maintaining or introducing more stringent measures for the protection of working conditions compatible with this Treaty."

Given the nature of the standards laid down in this area, they cannot constitute an obstacle to freedom of movement in connection with the internal market, and Member States can therefore lay down stricter standards.

With regard to environmental matters, the Community approach is laid down in Article 130r of the Single Act, paragraph 1 of which states that:

"Action by the Community relating to the environment shall have the following objectives:

- to preserve, protect and improve the quality of the environment;
- to contribute towards protecting human health;
- to ensure a prudent and rational utilisation of natural resources."

In addition, paragraph 2 states that:

"Action by the Community relating to the environment shall be based on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source, and that the polluter should pay. Environmental protection requirements shall be a component of the Community's other policies."

This last sentence is particularly important. It has made possible a "first" at Community level, the meeting of a joint Council on energy and the environment.

The Article also lays down that, in preparing its action, the Community shall take account of:

- available scientific and technical data;
- environmental conditions in the various regions of the Community;
- the potential benefits and costs of action or of lack of action;
- the economic and social development of the Community as a whole and the balanced development of its regions.

While decisions relating to the environment had to be taken unanimously by the Council under the Single Act, this has been radically amended under the Treaty on European Union. With the exception of provisions of a fiscal nature, measures concerning town and country planning and measures concerning the choice of energy sources, decisions may now be taken by qualified majority in cooperation with the European Parliament.

Finally, from the point of view of public health, it is important to note that, for the first time, the Treaty on European Union lays down areas of competence with regard to public health in Article 129 paragraph 1, which states that:

"The Community shall contribute towards ensuring a high level of human health protection by encouraging cooperation between the Member States and, if necessary, lending support to their action.

Community action shall be directed towards the prevention of diseases, in particular the major health scourges, including drug dependence, by promoting research into their causes and their transmission, as well as health information and education.

Health protection requirements shall form a constituent part of the Community's other policies."

4. Main regulatory approaches of chemical risk

The whole range of actions from total prohibition to use without restrictions can be found in Community legislation.

For clarify the following six categories will be illustrated:

- prohibition
- specific authorization
- notification

- classification
- obligation of information and labelling
- setting of limits

PROHIBITION

It can be complete or partial.

A complete prohibition can cover manufacture, use or both. However even in such cases, frequently specific exemptions are included in the legislation. Regulatory authorities usually do not like to be in a position to have to give specific authorizations.

For example in 1988, the Council adopted a Directive on the protection of workers by the proscription of specific agents. To prevent the exposure of workers the following agents are proscribed:

- 2- naphthylamine
- 4- aminodiphenyl
- 4- nitrodiphenyl

However, the more frequent case is that of partial prohibitions, or prohibitions of certain uses or procedures:

- prohibition as a food additive;
- prohibition of certain work procedures (e.g. spraying of asbestos);
- limitation to some very specific uses; such as use of crocidolite for asbestos cement and special gaskets.

SPECIFIC AUTHORIZATION

Such a procedure is used by authorities if generic in nature. Authorities are often reluctant to authorize an individual user due to the transfer of responsibility which might result.

NOTIFICATION

This approach is gaining favour with the authorities. The manufacturer or user has the obligation to inform the authorities of a situation and of the precautions taken, but the authorities do not have to respond. The responsibility rests fully with the employer; the authority can however check compliance with the notification procedures. Two recent directives at European Community level can serve as examples:

- demolition work involving asbestos
- major accident hazards (probably rather unique example).

CLASSIFICATION

The classification (physico-chemical and toxicological properties) of substances and preparations is not in itself a regulatory objective. However it allows appropriate measures to be taken as a result of such classification. For example certain uses can be automatically banned as the result of a classification. Another use can be the automatic labelling and packaging obligation for certain classifications. This obligation exists in the European Community.

OBLIGATION OF INFORMATION AND LABELLING

This obligation can take a number of different forms.

For example in the case of drugs, the information notices to doctors and patients must specify the counter-indications, use limits, possible toxic side effects, as well as measures to be taken in case of accidental poisoning.

Since 1967 a European Community directive has required a uniform labelling, indicating risks and precautions to be taken for a long list of toxicological classifications.

The EC labelling requirements are intended to provide a clear primary means by which all persons (workers as well as the public at large) handling or using substances are given essential information about the inherent dangers (safety and health) of certain materials.

SETTING OF LIMITS

This is the most common regulatory approach to limiting and controlling human exposure to dangerous agents.

The following different types of limits are covered by this concept:

- limits in workplace air
- ambient limits - air, water, soil
- limit values for discharge into the environment (effluent limits)
- contamination limits of food (pesticide residues)
- biological limits

5. Classification and labelling of dangerous substances and preparations

5.1. Classification and labelling of dangerous substances

In the context of chemical safety, hazard classification and labelling processes, including provisions for the dissemination of specific safety and health information, are an essential interface between risk and hazard assessment and risk management. The degree of hazard posed by each chemical to human health and the environment can then be recognised easily and unequivocally, the correct preventive actions be taken and safe use achieved.

Only a few significant classification and labelling systems, each addressing specific use patterns and groups of chemicals, exist already at the national, regional and international levels. Their harmonization, providing all countries with a common basis for classification and hazard communication, would improve greatly the worldwide exchange of knowledge on chemical safety and simplify international chemical trade.

In 1967, the Council of the EC adopted a Directive of the classification, packaging and labelling of dangerous chemicals which allowed for the first time the exact identification of a dangerous substance, whether by a worker, a user or a poison centre. The 1967 Directive has been amended 7 times over subsequent years.

The 6th Amendment adopted in 1979 contains provisions relating to the premarketing testing and notification of new substances and an expanded classification and labelling of

both new and existing substances. The 7th amendment adopted just last year (1992) contains detailed provisions regarding the labelling "dangerous for the environment".

The objectives of these Directives are now fully recognized as being two fold:

- The protection of man and the environment
- The elimination of technical barriers to trade.

The object of classification is to identify all the physico-chemical, toxicological and ecotoxicological properties of the substance which may constitute a risk during normal handling or use.

The Directive lists fourteen categories in which dangerous substances may be classified. The physico-chemical properties may be such that a substance must be classified as:

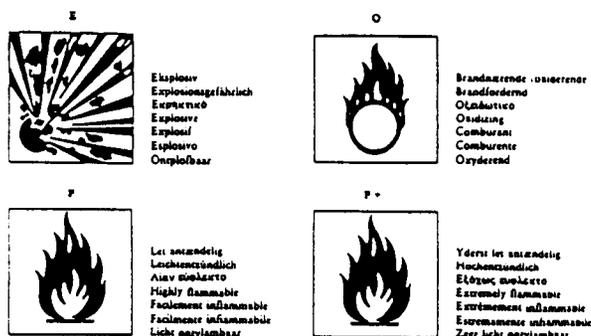
- explosive
- oxidizing
- extremely flammable
- highly flammable
- flammable

The symbols which must be applied in the case of such a classification are also shown in Fig. 2.

Figure 2

Symbols - Dangerous Substances

Physico-chemical Properties

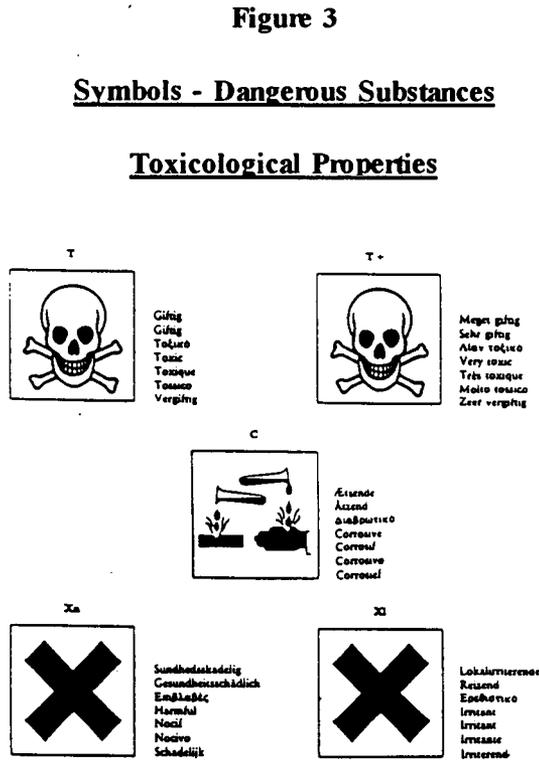


The toxicological and ecotoxicological properties of a substance may give rise to the following classification:

- very toxic
- toxic
- harmful
- corrosive

- irritant
- carcinogenic
- mutagenic
- teratogenic
- dangerous for the environment

The symbols for some of these classifications are shown in Fig. 3.



The definitions of these categories together with the classification criteria are given in the Directive.

As an example, Table 1 details the criteria for classification in the categories very toxic, toxic and harmful. These criteria - unlike other criteria - are adopted by the Council, and changes are currently under discussion.

Table 2

Category	LD50 oral rat mg/Kg	LD50 cutaneous rat or rabbit mg/Kg	LD 50 (inhalation) rat mg/l/4hr
Very toxic	< 25	< 50	< 0.25
Toxic	25 - 200	50 - 400	0.25 - 1
Harmful	200 - 2000	400 - 2000	1 - 5

A recent important development concerns the elaboration of criteria for the classification of a substance as "Dangerous for the Environment". Unlike the other categories which concern human health this category has been created for substances posing a threat to the different compartments of the environment such as the aquatic environment, soil, ozone layer etc (Figure 4).

Figure 4

Symbol - Dangerous Substances

Environmental properties



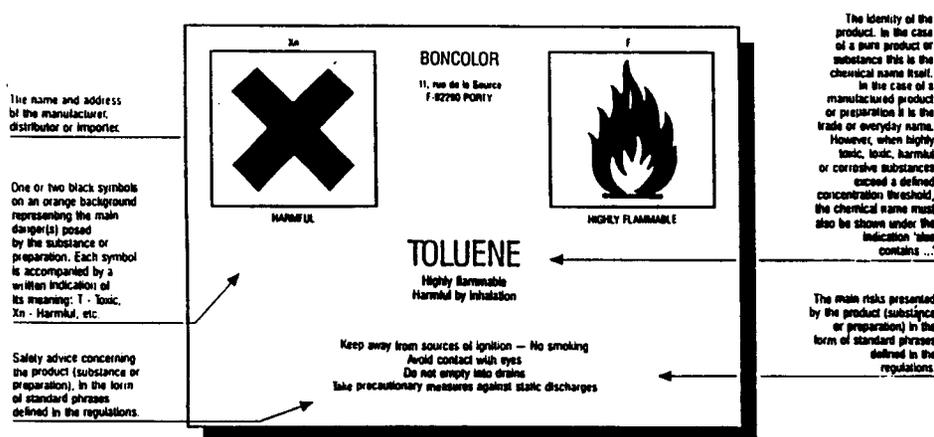
The primary objective of classifying substances dangerous for the environment is to alert the user to the hazards these substances present to ecosystems. For the purposes of classification and labelling and having regard to the current state of knowledge such substances are divided into two groups according to their acute and/or long-term effects in aquatic systems or their acute and/or long-term effects in non-aquatic systems.

Once the substance has been classified in one or more of these categories the label follows automatically from that classification. The most severe hazards are highlighted by symbols. The dangerous properties of the substance are specified in standard risk phrases the so-called (R-phrases), and safety phrases the so-called (S-phrases) give advice on necessary precautions. Fig. 5 shows an example of a typical label. It must draw the attention of persons handling or using a dangerous substance to the dangers involved.

Figure 5

Typical Label

A label on every container



It must take account of all potential hazards which are likely to occur during normal handling and use, and must clearly show:

- the name of the substance;
- the symbol and the indication of danger involved;
- standard phrases indicating the nature of special risks;
- standard phrases indicating safety advice; and finally
- the name and address of the manufacturer or the importer.

There are at present officially recognized around 60 Risk Phrases and about the same number of Safety Advice Phrases.

Since 1967, the Commission has published nineteen amendments with lists of chemicals, their classification and labelling requirements. The last amendment published in October 1993 contained a list of nearly 1400 substances.

In 1979 the sixth amendment to the 1967 Directive on classification and labelling made a distinction between "new" and "old" chemicals.

New chemicals require testing before marketing.

This immediately raises the question of the mechanism of the identification or definition of a "new" chemical. This was solved by a systematic listing of all the chemicals known to be available within the Community before 18 September, 1981. This official European Inventory of Environmental Chemical Substances then defines chemicals as "old" if they are listed and "new" if they are not.

Three major types of tests and three levels of testing requirements exist. These testing requirements are now part of the OECD base set.

5.2 Classification and labelling of chemical preparations

Up to now only chemical substances has been discussed. The 6th Amendment defines a substance as "a chemical element and its compounds as they occur in the natural state or as produced by industry, including any additives required for the purpose of placing them on the market." A preparation is a mixture or solution composed of two or more substances. Most of the chemical products on the market are indeed preparations. It is believed that close to one million such preparations are placed on the market every year. Often one simply varies the solvent composition as a function of the changing price of the various ingredients. How then should they be labelled ?

The Council of the European Communities adopted in 1988 a general Directive on the classification, packaging and labelling of dangerous preparations. The principles and definitions of this Directive are the same as in the Directive for dangerous substances. In order to establish the toxicological properties of a preparation other than carcinogenic, mutagenic or teratogenic the manufacturer has two possibilities:

- testing the preparation as a whole by using the standardized test methods for substances and the labelling criteria of the 6th Amendment Directive or,
- applying the conventional method laid down in the Preparations Directive using the toxicological properties of the substances, taking into consideration the concentrations of the constituents of the preparation. The Preparations Directive stipulates that concentration limits for substances are fixed, above which the whole preparation containing those substances must be labelled.

Test results have priority over calculation results and should be used except for carcinogens, mutagens, teratogens and sensitizers.

For these three cases of compounds, due to the important health consequences and the lengthy and costly nature of the tests, administrative limits have been set. However, these limits can be reviewed case by case by an ad-hoc group of experts as a function for example of the potency of the carcinogenic effects. Thus all preparations having a substance classified as a carcinogen, must be classified similarly and labelled at least toxic with the warning phrase "May cause cancer" if the concentration of that substance in the preparation exceeds 0.1%. A preparation has to be classified as leading to sensitization if it contains a substance identified as a sensitizer in a concentration exceeding 1%.

Labelling of dangerous chemicals and preparations needs to be supplemented by a more detailed information system for industrial users. The Council Directive concerning the classification, packaging and labelling of dangerous preparations and the 7th Amendment (1992) to the 1967 Directive on chemical substances provide also for the setting-up of such an information system in the form of safety data sheets.

Among other things, it contains ecological information which should give an assessment of the possible effects, behaviour and environmental fate of the substance of preparation, and disposal considerations giving information on the safe handling of residues.

6. Environmental measures

Community policy on combating the degradation of the environment is based on three principles: preventive action, controlling pollution at source, and the principle that the polluter should pay.

Community action regarding atmospheric pollution has developed along the following three lines of action:

- Establishment of standards:
 - standards and objectives for air quality;
 - emission standards for the main stationary and mobile sources;
 - product standards;
- Measurement and surveillance of the state of the environment,
- Promotion of research aimed at improving the understanding of and controlling the phenomena involved.

The Community's action regarding environmental air quality is based on three Directives, laying down air quality standards for sulphur dioxide and particles in suspension, for lead particles and for nitrogen dioxide. Their main objective is the protection of human health and, secondly, that of ecosystems.

Meeting these standards throughout the EC requires action against the pollutant sources, applying the appropriate techniques available. In addition, knowledge of how the various sources contribute to the total of the suspect emissions is essential for gauging the effort required on a technical and economic level.

Atmospheric pollution is spread by the winds, sometimes for thousands of kilometres, and is no respecter of frontiers. Pollutants undergo many physical and chemical changes before being deposited, and it is the famous acid rains arising from sulphur and nitrogen emissions which cause particular concern.

A policy based only on air quality could not stop this phenomenon. A policy aimed at controlling emissions, preferably at source, is required.

There are two possible routes for this:

- to act on the technological performance of the source of the emission, for example by increasing combustion efficiency or by filtering combustion gases;
- to act on fuel composition and lay down requirements for the use of certain types of fuel in specific installations, for example by limiting the sulphur content of fuel oils used in the home, in industry and in the transport sector.

In some cases, there must be simultaneous recourse to both routes in order to achieve the desired rate of reduction, and Community legislation has used both product standards and emission standards.

The environmental actions of the European Community are supported by a substantial budget, the main components of which are summarized in table 3.

In importance of the European Environment Agency, which will start functioning in 1994 in Copenhagen has to be stressed. The Agency will provide the Community and the Member States with objective, reliable and comparable information at European level to:

- take the requisite measures to protect the environment;
- assess the results of such measures;
- inform the public about the state of the environment.

Ten major tasks are set for the Agency among which:

- establishing an information network;
- providing the Commission with information for legislation at Community level;
- comparability of data;
- development of forecasting techniques;
- development of methods for cost damage evaluation as well as cost of environmental prevention, protection and restoration policies;
- state of the environment reports (3 years)

7. Workplace Occupational measures

It is only 12 years since the European Community took a decisive step in the field of health and safety at work when, in 1978, the Council of Ministers for the first time adopted an action programme on a proposal from the Commission.

It can be stated that the European Community is now clearly recognised as the driving force behind the development of new legislation relating to health and safety.

Community texts relating to the health protection of workers in relation to chemical agents present at workplaces cover all dangerous chemical substances on the one hand and, on the other, individual substances or groups of substances.

The EC legislation, in form of Directives, adopted up to date includes a number of important principles to ensure adequate and improved health and safety at the workplace. Among these principles the following deserve special attention:

- Assessment of workplace risks.

Employers are required to make assessments to workplace risks, including a safety plan for the operation of the facility, and to develop an overall policy that enumerates how the company tends to minimize or eliminate workplace risks;

- Competent health and safety personnel

Employers have to designate competent health and safety personnel or use competent outside services (the definition of competent personnel is left to each Member State);

- "Balanced participation" between employers and workers in the decision making process.

Employers shall consult workers and/or their representatives and allow them to take part in discussions on all questions relating to safety and health at work. Employers must also allow workers representatives with specific responsibility for the safety and health of workers adequate time off work, without loss of pay, and provide them with the necessary means to exercise their rights and functions;

- Workers' right-to-know of risks

Employers must ensure that workers and/or their representatives receive all the necessary information concerning the safety and health risks and the protective and preventive measures taken to minimize these risks; employers must furthermore ensure that this information is provided also to temporary workers and workers from other undertakings present on the site;

- Serious and imminent danger

Employers must ensure that all workers are able, in the event of serious and imminent danger to their own safety and/or that of other persons, and where the immediate superior responsible cannot be contacted, to take the appropriate steps in the light of their knowledge and the technical means at their disposal, to avoid the consequences of such danger. Further workers who, in the event of serious, imminent and unavoidable danger, leave their workstation and/or a dangerous area may not be placed at any disadvantage because of their action and must be protected against any harmful and unjustified consequences.

- Health and safety training

Employers must ensure that workers receive adequate training to be repeated periodically if necessary in this area, in particular in the form of information and instructions at least in the following cases:

- recruitment
- transfer or change of job
- introduction of new equipment or technology or change of equipment.

Workers from outside undertakings must receive appropriate instructions regarding health and safety risks during their activities.

Workers' representatives for health and safety are entitled to appropriate training.

These trainings must not be at the workers' expense and should take place during working hours.

Since 1978 a relatively large number of directives and recommendations have covered to occupational risk related to chemicals: framework legislation, major industrial hazards, systems for marking containers and pipes used for dangerous substances and preparations, carcinogens, exposures limits, and individual chemicals such as vinyl chloride monomer, lead and asbestos.

In 1993 the Commission proposed a new Directive to update and consolidate the past legislation on chemicals and bring it more in-line with the new overall approach on Health and Safety at Work.

The proposal as it stands covers all chemicals agents without prejudging whether or not they are hazardous. This is important because even chemical agents that are nominally harmless may interact with others to create or enhance a risk. If it can be shown that for any particular chemical there are no foreseeable risks from the chemical or its interaction then no further action is required once the assessment has been completed. The proposed Directive follows closely the Convention on Chemicals adopted by ILO in 1990, and which has thus already a substantial measure of acceptance world-wide.

All these principles are currently being implemented by Member States in their national legislations and/or regulations. Of course several important questions remain:

- how will these principles be enforced in Member States ?
- will the regulations have enough teeth ?
- who will enforce them ?

For example now the qualification requirements for labour inspectors vary widely from Member State to Member State.

The recent Council decision to create European Agency on Health and Safety at Work in Bilbao will help the Commission with the development of its actions in this field and will be a major source of information for Member States, employers and workers.

8. Conclusions

The development and successive amendments of the Treaties have led each time to a greater awareness of the question of health at Community level, giving the means to act whenever necessary while maintaining the principle of subsidiarity; i.e., the Community only acts when the objectives of a planned course of action cannot be satisfactorily achieved by Member States and may, by reason of the scale or the effects of the planned action, be better carried out at Community level.

In both areas, that of environmental protection and health and safety at work the main target of the Community up to the year 2000 is to ensure the correct transposition by Member States of Community Directives into national legislation, and their effective implementation through appropriate monitoring and control measures, and maximum transparency.

Experience has already shown that all the countries, including those which have high levels of safety and health legislation and environmental legislation, will be required to upgrade and improve their laws to comply with the new European Community Directives.

The recent agreement between the European Community and the European Free Trade Association (EFTA) setting up a free trade area means that all the health and safety at work legislation and the health and safety requirements based on Article 100A will be automatically applicable the EFTA countries.

Furthermore Association agreements have been signed between the European Community and respectively Hungary, Poland, Romania, and the Czech and Slovak Federal Republic. Association agreements are currently being negotiated with Bulgaria. Regarding Russia, Belarus, Ukraine and Kazakstan, partnership and cooperation agreements are envisaged. In these texts reference is made both to Health and Safety at Work and to the Environment.

We are living more and more in an interdependent world. The rules made in one part of the world will affect the rest. The practical implementation of the GATT agreements may be hampered by technical barriers to trade. We must not only learn each others rules but also understand them and their background. In this way a rapprochement could be achieved, by taking the best from all sides.

Two years ago an article in the Magazine "Health and Safety" "EC 92: Here comes a new set of rules" tried to spell out the inevitable implications for the USA, many of which are

valid for the three NAFTA countries. For example all products which may pose a health and safety risk are considered regulated products in the European Community. Concerning workplace products they include: machinery, electrical equipment, pressure and gas vessels, chemicals, lifting devices, personal protective equipment, etc.... The article claims that US exports to the European Community account for "nearly a quarter of total US exports and support nearly two million jobs". Of these exports 2/3 concern regulated products, of which probably over 1/5 would require third party certification. Furthermore the article stresses that the Health and Safety Directives at the Workplace will force reassessment of work practices in particular by US companies overseas. According to an official of the AFL-CIO "Building Trades" "Europe is about 20 years ahead of us when it comes to taking a holistic approach to safety and health". He considers that many of the EC Member States "already have comprehensive safety-and-health programmes, and emphasize accreditation and certification among safety professionals to a greater degree than in the USA".

An in-depth understanding of the European Community, its decision making process, and its future perspectives could probably also help understanding what is likely to be faced by NAFTA to ensure a smooth functioning of the Agreement.

As a final conclusion it must be again emphasized that most of the environmental and occupational health and safety rules in the Member States of the European Union are made by the Union, transposed by Member States and actively monitored by the Union. In the areas of environmental health and health and safety at work more and more the basic legislation of the Member States of the European Union is that of the European Community. Disputes between Member States, between the Commission and individuals and Member States, and even between individuals and Member States in these fields use as reference Community legislation and national legislations derived from it and not differences in national legislations. As national legislations have to comply with Community Directives they cannot constitute barriers to trade and be involved in the context of social dumping.

J. Rantanen

IDRC Cooperative Study on Occupational and Environmental Health Workshop,
Ottawa 28.-30.3.94

WORLD MODELS OF OCCUPATIONAL AND ENVIRONMENTAL HEALTH SYSTEMS

About 2,400 million (45%) out of the total 5,300 million population of the world comprise the global workforce. As much as 58% of the population aged 10 years and over belong to that working population (Table 1). Some 1,800 million work in the developing countries and about 600 million (25%) in the industrialized world. About 40-50 % of the world's workforce are employed or self-employed in the primary production (agriculture, forestry, fishing, mining and quarrying), 20 % in the manufacturing sector and the rest in private or public services.

Table 1. *Working populations in the world in 1990 and 2000*

Region	1990	2000	Growth %
Africa	230	302	31.3
Asia	1,410	1,646	16.7
Europe	380	400	5.3
South and Latin America	158	199	25.9
North America	180	200	11.1
Total	2,358	2,747	16.0

There is a wide variation in the economic structures, occupational structures, conditions of work, quality of the work environment, and health status of workers between different regions of the world, different sectors of economies and between different countries. Parallel to such qualitative differences of the working life, also the average GNP/capita varies by a factor of 12 between the highest-income and lowest-income countries and the average GNP/capita in the Third World is only one fifth of the respective average of the OECD countries.

Demographic trends

Numerous demographic changes are foreseen in the working populations of both the developing and industrialized countries. The absolute number of workers will increase with 389 million by the year 2000 and 90% of that growth will take place in developing countries. This simultaneously implies the need to produce about 400 million new job opportunities. In spite of the high infant mortality in Africa, Asia and Latin America, the average age in all regions is increasing. Because of such lengthened

life expectancy the most prominent qualitative trends of the working populations are the increase of the average age of workers, elevation of the level of their education, increase of unemployment rates which may stay high for several years and growing participation of women in the working life in most parts of the world. To a great extent, the occupational health needs of about 100 million child workers in the world still remain unrecognized and are likely to affect both physical and mental development of these young individuals.

Unemployment is one of the most striking phenomena in the global working life of the 1990s. The ILO estimate of 820 million unemployed at present means 30 % of the global workforce. In several developing countries the unemployment rates as measured by the criteria of industrialized countries may be as high as 50-70 %. Particularly young people in Africa and Latin America are at a high risk of unemployment.

Future trends in economies

The future economic scenarios prepared by the international economic and trade organizations speak for the diverse development of the various economic sectors in different parts of the world. This will also have an impact on occupational structures and occupational health as well. The main recognized trends are the growing internationalization, economic integration within the regions, such as North America, Europe and South-East Asia, and the growing competition between the Regions. Slowing down of the economic growth in the industrialized world and the annual growth of 3.4-5 % in developing countries, particularly in South-East Asia and especially China are expected. Increase of the productivity of agriculture in the developing countries, increase of the role of industry in the lower and upper middle-income countries and decrease of the role of industries and agriculture for the benefit of the service sector in the industrialized countries are also foreseen. Highly unstable and turbulent changes have been experienced and are still likely to be seen in the countries of the eastern Europe. The expected global trends are briefly described as follows:

1. Tripolar integration of the industrialized world showing Europe, North America and Japan with other South-East Asian countries as the most important centres of economic activities.
2. Growing share of industrial production and trade of newly-industrialized countries and particularly China.
3. Decreasing share of the least developed countries in the world production and trade (Global 2000, UN, 1990).

Development in the problems of occupational and environmental health

As an impact of advances in science and technology, new developments in the working life will also be seen, particularly in the industrialized countries. The implementation of new information technologies, automation, further mechanization, new materials,

growing production and use of chemicals, industrial-scale implementation of biotechnology, low-impact processes, low-energy production and low-waste and recycling industrial strategies will have a great impact on the production systems and the work environment in all sectors of economy.

The industrialized countries are struggling for high productivity, high quality and new innovations. To see any success in these aspirations requires the establishment of working conditions which are conducive for the development of new skills, high motivation and creative ideas. The Third World countries would benefit enormously by controlling the traditional occupational health hazards, accidents and occupational diseases, as well as by taking better care of the general health situation of the working populations.

As a consequence of such developments major changes in production systems, organization of work, occupational structures, job demands and contents, as well as in occupational health and safety are already seen and the trend will continue in the foreseeable future. Most of the OECD-countries moved in the 20-year period (1970-1990) from the majority of the blue-collar occupations to the dominance of the white-collar jobs. The overall impact of such developments on occupational health is likely to be positive, while exposure to many of the traditional physical, chemical and mechanical hazards will be effectively prevented or controlled. Simultaneously new job demands, increased need to process and analyze information and several control-room-like activities may increase the psychological problems of work. The higher demands for learning and for developing new working skills are also recognized.

Depending on the structures of economies, level of industrialization, climatic conditions, developmental stage, and tradition in occupational health and safety, the occupational health status of workers and workplaces vary substantially. The estimate of ILO gives 100 million occupational accidents and 200,000 fatalities a year among the global work force (the numbers which will give the average risk figures of 42/1,000 for the total number of accidents and 8.30/100,000 for fatalities – the values well comparable with the European risk averages [20-100/1,000 for the total number and 0.25-20/100,000 for fatalities] with averages at 25/1,000 and 6.25/100,000). The estimation of rates for occupational diseases is difficult due to the shortage of data and to variation in the recognition of a disease as an occupational malaise in different countries. Extrapolation on the basis of incidence in the well-registered European countries (3-5/1,000) gives the world annual incidence of occupational diseases of about 7.2-12 million cases out of which about 30-40% may lead to a chronic condition and about 10% to permanent work disability, and according to a crude estimate, about 0,5-1% to death.

Several cases of industrial disasters show that the workers in developing countries are much more sensitive to consequences of such major hazards than the workers in the industrialized world. The difference is due to less effective protective measures, less

organized preparedness for such accidents and higher density of settlements and populations within or in the neighbourhood of an industrial setting.

The environmental health concerns in the industrialized countries are mainly due to pollution of air by nitrous and sulphur oxides, exposures to particulate polycyclic aromatics, increase of ozone concentrations at the breathing zones (while just the opposite happens in the stratosphere), contamination of water and food in certain areas with chemicals, microbials or natural toxins, problems of indoor air in the housing and social degradation of human settlements, particularly in the central metropolitan areas and densely populated suburban zones. The increasing motor vehicle density constitutes the major source of air pollutants and in some rapidly motorized countries causes a real epidemic of traffic accidents.

The respective problems are found in the large areas of developing countries, added with poor water supply, insufficient sanitation arrangements and poor nutrition. Most of the environmental health problems in the rural areas of the Third World are due to inappropriate use of pesticides. Growing migration from the rural environment to urban areas in order to find employment makes a major problem of environmental health in the developing and newly industrialized countries.

Risks of an occupational disease and accident vary substantially between different occupations. For example, in Finland there is a 30-fold difference in the occupational accident risk between the low-risk and high-risk occupations and a 40-fold difference in the risk of an occupational disease.

Depending on the structure of economy, level of occupational health and safety and the level of technical development, 20-50% of workers may be exposed to hazardous factors at work in the industrialized countries and the rate may be even higher in the developing and newly industrialized countries up to the level of 70-100 %. While mechanical factors and physical and chemical agents dominate in the industrialized manufacturing exposures to the pesticides, heavy physical work, organic dusts and accidents are the occupational burdens of the agricultural workers. In the most unfavourable conditions of NIC- and developing countries up to 50-100% of workers in the hazardous industries may be exposed to the levels of chemical, physical or biological factors which exceed the occupational exposure limits applied in the industrialized countries and signs of occupational diseases may be detected in over half of the workers in such high-risk occupations.

Economic consequences of occupational and environmental health risks

The economic consequences of the occupational and environmental hazards are difficult to estimate precisely. Some rough explorations have, however, been made at international and national levels. The World Development Report 1993; Investing in Health, indicates the total health burden of populations at 14 years or older at the level

of 886 million DALYs (Disease Adjusted Life Years). A share of 318 DALYs (46,4 %) was attributed to occupational factors such as cancers, mental disorders, chronic respiratory diseases, musculoskeletal disorders and unintentional injuries. It is important that estimated possibilities to reduce the health loss due to occupational factors were at levels 5 % to 50 % depending on the type of the disease. When the environmentally determined disease burden was added (99 mill DALYs) the occupationally and environmentally determined health losses comprised 61 % of the total disease burden of the adult populations. This data demonstrates the importance of a preventive strategy in the control of the disease burden of the adult population, and particularly of the working population.

Some national calculations from the Nordic Countries show an economic loss caused by occupational accidents and diseases at some 3-5 % level of the GDP by occupational factors and up to 13-20 % level of the GDP due to decreased working capacity as a consequence of exposures to both occupational and non-occupational factors which affect the functional capacity of the workers. Such data emphasizes the potential positive impact of preventive programmes of both occupational and environmental health. The data at the national level shows a close correlation between the high GNP/capita and effective occupational and environmental health programmes while the less ambitious countries cannot show any positive economic impact from saving in investments for health.

International guidance for improvement of occupational and environmental health

The WHO Alma Ata Declaration (1978) on primary health care emphasized the need to organize primary health care services (both preventive and curative) "as close as possible to where people live and work". The Declaration also emphasized that in the organization of such services, high priority should be given to those people most in need, including the working populations at high risk. In 1979 a new strategy for the further development of occupational health was launched when the World Health Assembly adopted the Resolution WHA 32.14 on Comprehensive Workers' Health Programme. In 1980 the Resolution WHA 33.31 encouraged the countries to integrate occupational health with the primary health care services to cover the underserved populations, particularly in the developing countries. In the same resolution, a need for further development of occupational health services in general, as well as training and research on occupational health were also emphasized.

The International Labour Organisation has an important global instrument for guiding the developments of working conditions in the Member Countries by providing International Conventions and Recommendations. Out of about 175 Conventions and Recommendations given by the ILO for regulation of conditions of work some 70 instruments deal with occupational health and safety. In 1959 the ILO Recommendation No. 112 on Occupational Health Services encouraged countries to

establish and develop occupational health services at the places of work for prevention and control of occupational health hazards. In 1981 the ILO published the international Convention No 155 and Recommendation No 161 on Occupational Safety and Health and in 1985 the 71st International Labour Conference adopted the International Convention No. 164 and Recommendation No. 171 on Occupational Health Services. These instruments further encourage and guide the development of comprehensive multidisciplinary occupational health services for identification, prevention and control of health hazards and promotion of health and well-being at work. These ILO instruments from the 1980s still constitute a solid guidance for the improvement of occupational health and safety. For example Sweden and Finland have ratified and faithfully implemented them.

The WHO VIII General Programme of Work for the Years 1990-1995 recognized the health problems of the working populations to be of serious magnitude, particularly in the underserved sectors of almost all developing countries. Little attention has been given to workers in agriculture, small-scale industries, construction and mining. The Programme called for extension of primary health care to the underserved working populations, as well as providing guiding principles for supporting legislation for primary health care action at the workplace.

The ambitious target of having at least 70 % of countries develop occupational health programmes was set by the WHO VIII General Programme of Work. As a means for achieving such a target, the WHO Workers' Health Programme in collaboration with the ILO and countries was called for identification and control of health hazards at work, for identification of national priorities, for evaluation of the occupational health measures, for informing employers and workers, for catering the needs of high-risk groups and child workers, agricultural, mining and small-scale industry workers, as well as of those working in construction industries and in home industries. Training of both the occupational health personnel and primary health care workers in issues of occupational health was also encouraged, based with training material and guidelines for appropriate practices. In addition, global a data system for monitoring morbidity and mortality trends in major occupational and work-related diseases and injuries was also requested by setting up standard guidelines for data collection and reporting. Guiding principles and standards for occupational exposure limits were also expected. Much emphasis was given to communication of information on occupational health between the Member Countries and to the development of the network of collaborating centres in occupational health.

Though major efforts have been invested by the WHO, its Regional Offices and the Collaborating Centres together with the Member Countries, the ambitious targets of the VIII General Programme of Work are likely to be achieved only in part. There are several reasons for this, the most evident being the extremely limited resources available from the WHO for the implementation of the Workers' Health Programme, economic recession in most of the Member Countries with concomitant instability and

constricting resources for occupational health, and emergence of new acute problems, such as rapid structural changes in the working life and changes in the political priorities, for example to alleviate the problems related to severe unemployment in the Member Countries. All this has happened in times when occupational health would have been needed even more than before, particularly in countries where the transition of economic systems and the development of working life in general has been turbulent.

The UNCED Agenda 21, as well as the recommendations of the WHO Commission on Health and Environment contain several items concerning directly or indirectly occupational and environmental health. The environmental health targets cover the major part of the Agenda 21 (more than 150 objectives) dealing with the most important environmental health hazards in the world. The items consider, in addition to general aspects of chemical exposures, chemical safety and risk assessment, also specific addresses to occupational health and safety, such as surveillance of occupational exposures, setting of exposure limits, epidemiology of occupational diseases in view of dose-response-relationships between the exposure and the outcome, control of toxic exposures and prevention of occupational accidents and injuries. These recommendations are expected to guide the appropriate plans and programmes of WHO and ILO up to the year 2000 and beyond. On the other hand, in addition to the specific occupational health and safety targets many of the chemical safety and environmental health targets cannot be achieved and implemented in practice without the full participation and contribution of occupational health approach. Monitoring of the environment, establishment of environmental health services, training and education of experts in the field, environmental education and information of workers and the general public, management and politicians, and research and prevention of such hazards are the most important strategies for the future.

The occupational health strategies of the European Union will be described in another paper in this Symposium. Thus, only the 16 Directives concerning various aspects of occupational health and safety and guiding the national practices in the EEC + EFTA countries are recognized here. Similarly, EU has designed an Environment Programme that also contains ambitious environmental health targets for the 1990s. Together with the WHO/Euro the EU has also produced in 1989 the Environmental Health Charter of Europe that contains general objectives for the development of environmental health in Europe. An action plan for further concrete actions on environment and health will be presented to the European ministeris of environment and health in June 1994 in Helsinki. That action plan will simultaneously be the implementation programme of the UNCED Agenda 21 in the European Region.

National strategies for occupational health

About 80 % of the European countries have legal provisions on occupational health services, while the rest of the countries (6) the system is based on a voluntary activity or on collective agreements between employers and workers.

On the basis of guidance by the international organizations, the overall objectives of such legal provisions on occupational health services are embodied in five principles:

- protecting workers' health against hazards at work (the protection and prevention principle),
- adapting work and the work environment to the capabilities of workers (the adaptation principle),
- enhancing the physical, mental and social wellbeing of workers (the health promotion principle)
- minimizing the consequences of occupational hazards, accidents and injuries, and occupational and work-related diseases (the cure and rehabilitation principle),
- providing general health care services for workers and their families, both curative and preventive, at the workplace or from nearby facilities (the general primary health care principle).

Different countries have implemented those principles in very different ways: some countries, such as the Nordic ones, have included all the five principles in their occupational health programmes, while some others accept only the preventive actions in their occupational health agenda. The selection of basic principles will have a major impact on the activities and contents of occupational health services. For example the following options are found in Europe:

- essentially preventive functions, mainly workplace visits and health examinations, and first aid (in Belgium, France, the Federal Republic of Germany, Luxembourg, Monaco, the Netherlands, San Marino and Switzerland)
- preventive functions, supplemented by selected curative and general health care services on a statutory or voluntary basis (in Austria, Finland, Italy, Norway and Sweden), and
- comprehensive workers' health services, including both preventive and broad curative services (in Hungary, Iceland, Italy, Poland, Romania, and Russia).

Depending on the national tradition the body in charge of such a policy may be the Ministry of Labour or Ministry of Social Affairs and particularly in Europe the Ministry of Health.

Activities of occupational health services OHS)

While the international guidelines encourage countries to organize services for all people taking part in the working life, the coverage is still far from complete in all countries. The percentages of coverage e.g. in the Western European countries vary

between 15-90 % of the engaged workers and 5-80 % of the total workforce. In many developing countries only a small fraction of the workforce is covered.

Irrespective of differences in the legal basis, organizational model, source of funding, or general operating conditions of occupational health services, countries use similar methods for the implementation. Variation is mainly seen in the number of functions included, but not very much in the content of services of individual activities. Well-developed occupational health services were concluded by the WHO/Euro consultation on occupational health services (in 1989) to be the following:

1. surveillance of the work environment
2. initiatives and advice on the control of hazards at work
3. surveillance of the health of employees
4. follow-up of the health of vulnerable groups
5. adaptation of work and the work environment to the worker
6. organization of first aid and emergency response
7. health education and health promotion
8. collection of information on workers' health
9. provision of curative services for occupational diseases
10. provision of general health care services.

Depending on the basic policy of OHS in the country the functions 1-10 are found to a varying extent in the OHS programmes. Functions no 1, 2, 3, and 6 are found to be the absolute minimum content of OHS. Following comments of these activities can be made:

a) **Surveillance of the work environment**

The surveillance of the work environment, in order to identify and assess hazards and risks that may affect workers' health, involves the use of many methods, such as walk-through surveys, occupational hygiene measurements, ergonomic analyses and psychological and toxicological assessments. Countries such as Finland, Germany and the United Kingdom have issued specific guidelines for systematic surveillance. A typical survey of the workplace includes a visit of an occupational health team, during which potential hazards are identified and assessed, usually according to a standardized guidance, a formula or a checklist and the most important exposures and problems, as well as the exposed workers, are identified.

b) **Initiatives and advice on the control of hazards at work**

Advising on and starting practical control measures for eliminating, managing or minimizing the hazards at work are the logical preventive steps, when a hazardous condition has been identified and assessed, or when new industrial workplaces are planned and constructed. Although included in legislation in many countries, this function is comparatively weakly developed. Effective implementation requires the participation of both workers and the

management. In countries, such as Finland and the Netherlands, occupational health services have a statutory obligation to take part in planning of industrial installations, organization of work, and selection of machinery and tools.

c) Surveillance of the health of employees

The surveillance of employees' health has traditionally included health examinations, carried out before the employment or assignment, periodically during exposure to specific health hazards, after a return from sick leave or before placement in a new job. Special health examinations are conducted of workers with chronic diseases. Some health surveillance activities are usually not mandated by legislation, but may be carried out to protect workers' overall health. These include general health examinations of certain age groups (at five-year intervals, for example), examinations of working women (particularly those, who are pregnant or have small children), young workers and retired people who were exposed to specific hazards during their working lives.

The battery of health examinations carried out differs considerably between countries. The most distinct variation is between occupational health services that are limited to preventive functions and health examinations strictly related to the workplace exposures, and those that are comprehensive and include examinations related to workers' overall health.

d) Follow-up of the health of vulnerable groups

The follow-up and rehabilitation of the health of vulnerable groups, such as elderly workers and those with chronic diseases (including cardiovascular or musculoskeletal disorders and allergies), is a function of comprehensive occupational health services. The objective is to observe the potential effect of work on a disease or a physiological condition, and to take early measures for reassignment or rehabilitation, and for preventing the further development of the health problem.

e) Adaptation of work and the work environment to the worker

Adapting work and the work environment to the physical and mental capabilities of the worker is particularly necessary for workers in vulnerable groups and those with health problems. According to the most recent trends in occupational health services, however, this is expected to involve the consideration of the individual needs and capabilities of all workers, regardless of age, sex or state of health. Some countries, such as Sweden, have promoted this activity through specific programmes and with economic incentives from the government.

f) Organization of first aid and emergency response

The organization of first aid and emergency response is a traditional responsibility of occupational health services in all countries. It covers preparedness for accidents to and acute conditions in individual workers and the planning of the response to incidents affecting an entire undertaking, in collaboration with other respondents. Training in first aid is a universal duty, even though occupational health personnel are not usually the first to respond to accidents. Nevertheless, they must ensure that all the personnel involved are well trained and that the contacts necessary for preparedness have been made.

g) **Health education and health promotion**

Health education is organized to inform the worker and employer about hazards related to particular jobs, substances used at work and working practices. This activity is aimed at modifying the work environment or practices, to minimize possible health hazards and to suggest alternative measures to make work safer and healthier. Traditional forms of this activity include advice to workers on the selection and proper use of personal protective devices, such as gloves, and guidance for hygiene practices in jobs where, for example, toxic contamination may be spread by workers' hands.

Health education may also be general. It aims at introducing elements of a healthy lifestyle that may be important to workers in certain occupations. This includes eg. advice to solvent workers to avoid alcohol and the distribution of anti-smoking information to asbestos workers. Sometimes occupational health services take part in the general health education campaigns organized by others, such as primary health care or voluntary health organizations. The campaigns may focus, for example, on smoking control and the promotion of healthy nutrition and physical activity.

Again, countries vary in the scope of health education. Education on specific occupational hazards is given in countries with strictly preventive services, and both occupational and general health education in countries with comprehensive occupational health services.

h) **Collection of information on workers' health**

The most traditional form of this activity is the recording of occupational diseases and occupational accidents found in most countries. In some countries, occupational health services keep statistics on sickness absenteeism, make formal reports on the surveillance of workplaces and record the results of health examinations and data on other aspects of surveillance of the work environment or relevant exposures (e.g. to carcinogens). In some instances, occupational health personnel carry out epidemiological research on various aspects of the health of the workers in a specific undertaking.

i) Provision of curative services for occupational diseases

Even in countries whose occupational health services are strictly preventive (such as Belgium and France), occupational diseases may be diagnosed. In other countries, such as those in Eastern Europe, preventive, diagnostic and full-scale therapeutic services for occupational diseases are provided. These may include:

- the full or partial diagnosis and treatment of certain occupational or work-related diseases (examples include the diagnosis of a hearing loss or treatment of a simple toxic eczema):
- the rehabilitation of workers, regardless of the cause of the disease,
- the referral of cases of an occupational and a work-related disease to other health services, on the basis of observations made in connection with other occupational health service activities (such as health examinations), and
- first aid and emergency response.

j) Provision of general health care services

General health care services may include both the prevention and treatment of non-occupational diseases and other relevant primary health care services, such as immunization and general health education. The level of service usually corresponds to that provided by a general practitioner, although full-scale medical services, with hospital units and appropriate outpatient services, may be organized for large industrial establishments. In Eastern European countries, such hospital units are compulsory for undertakings employing 10,000 workers or more.

Organizational models

Organizational models for occupational health services vary between and within countries, according to national traditions, the general model of organization of occupational health and safety and general health services, and the nature of the industrial or economic activity concerned. Seven models are used in the European Region: the big industry, group service, private health centre, community health centre, national health service and social security institution model and private physician models. Japan follows mainly the big industry and group centre models.

Big industry model

The big industry model is typical for large units in the manufacturing and processing industries, but is also used in other large industries. Occupational health services are provided by in-plant units, usually staffed by a team of full-time experts. In the largest undertakings, such a team may be multidisciplinary. In addition to a physician and nurses, it may include a physiotherapist, an occupational hygienist, a safety engineer and a psychologist.

Some countries have legal provisions that require undertakings employing more than a given number of workers to organize such in-plant services. For example, in Hungary an undertaking employing at least 4,000 people must appoint a physician, if it employs a minimum of 10,000 workers, an out-patient department is obligatory. In Portugal, undertakings employing even fewer than 200 people must provide in-plant service, if high-risk occupations predominate. In Romania and the former USSR, large industrial undertakings were requested to organize comprehensive medical service systems, including hospitals, clinics, out-patient departments and preventive services.

In France, on the other hand, the provision of in-plant occupational health services is obligatory for undertakings requiring at least 160 hours per month of physicians' working time. This need is calculated with a formula that takes into account the occupational health and safety hazards of the industry and occupation concerned. In practice, this minimum figure corresponds to the working schedule of a full-time physician.

The big industry model has several advantages and at least one disadvantage. The provision of services within an undertaking enables personnel to collect all relevant information on the workplace, and makes work to control and eliminate hazards easier. Integration with safety services is also easier to organize than in other models. The disadvantage is the possibility of weaker links with primary health care services.

Group service model

Sometimes small and medium-size undertakings join to organize occupational health service units of a certain size and quality. Some countries (Austria, Belgium, France, the Netherlands and Spain) make legal provisions for the establishment of such group service centres by undertakings that are not large enough to organize their own services. These centres are administered by a body that usually includes representatives of both the employers and the workers of the participating undertakings. The undertakings pay for the services according to their use. Thus the member undertakings are the owners or shareholders in the occupational health service units, which usually operate on a non-profit basis.

In France, a unit may serve several different types of undertakings in a given geographical area, or a number of undertakings with the same type of economic activity. Classic examples of such industry-oriented services are also found in construction industries in Sweden, and various industries in Denmark.

Like other models for external services, this model does not enjoy all the advantages of the big industry model, owing to the lack of daily contact with the workplaces. The strengths of trade-oriented services are their mobility, flexibility and opportunities to

accumulate knowledge on the special occupational health problems of the trade or branch of industry which is served.

Private health centre model

This model is used in several countries in Western Europe. Physicians' health centres provide services: they function as a group service but are not managed by the industries concerned. These centres sell their services and are private undertakings themselves. The undertakings and workplaces to whom services are provided are customers, and the profit principle is usually applied. This model is used to a small extent in Finland. In an alternative form of the model in the Federal Republic of Germany, a private physician is hired to provide occupational health services.

The strength of this model is its flexibility. Unfortunately, a concern for profit may influence the orientation of activities, and the undertakings served do not participate in the management of the services provided. It has also been presented some concerns about the competence of part-time private physicians.

Community health centre model

This model implies the provision of occupational health services by municipal or other public health service units that give local-level primary health care. In Italy, local health units are legally responsible for providing occupational health services to small and medium-sized undertakings. Community-based health services are also used for this purpose, in part, in Norway and Sweden. In Iceland, all occupational health services are given by local health centres, although the plant physicians of large undertakings can carry out health examinations. On the basis of specific legislation in Finland, municipal health centres provide about 40 % of occupational health services, particularly for small undertakings, the self-employed and agricultural workers.

This model, too, has both advantages and drawbacks. On one hand, where the network of local health centres covers the whole country, the services are accessible to the workers. In addition, integration with primary health care is automatic. On the other hand, local health centres have difficulties in handling the occupational health problems of a large number of undertakings engaged in widely varying activities. To meet the specific requirements of occupational health services, larger municipal health centres employ specially trained physicians and nurses on a full-time basis. The personnel in smaller units, working on a part-time basis, take special courses on occupational health, and may be supported by experts from a regional institute of occupational health, or other appropriate institutions.

National health service model

The national health service model is another community-based alternative. Although the occupational health units are located in undertakings, their costs are covered by national health service. The former German Democratic Republic, Hungary, Poland, Romania, the former USSR and, with certain modifications, Yugoslavia used such a model. This model shares the strengths of the big industry model. In fact, it provided services only for large industrial undertakings in the seven countries mentioned above. The scope of the activities and the level of facilities needed require a large population to be served. Finally, this model combined effectively occupational health with general health services, constituting a comprehensive workers' health service. Some concern was expressed, however, about the possibility that broad curative activities may overshadow the preventive priorities of the occupational health services. This model is now disappearing as a consequence of changes in the economic systems and due to splitting of big state-owned combinats to smaller undertakings.

Social security institution model

In this model, a social security institution provides, and frequently finances, occupational health services. This model operates in a way similar to the group service model. It is used in part of the Federal Republic of Germany and in Turkey. In Israel, the national occupational health service system is organized and administered by the General Sickness Insurance Fund of the General Federation of Labour Unions.

Experiments with new models

Small undertakings, mobile workplaces and the self-employed constitute a challenge for occupational health services. Attempts to solve the problem of serving workers in small undertakings include services provided by: groups of undertakings, a network of community-based primary health care units and industry-oriented units. In Hungary, the units located in large undertakings also serve small undertakings located in the same area. Italy has carried out an interesting geography-based experiment in which a number of small undertakings are clustered, analyzed and served by local health service units. The information gathered is used to plan activities for all similar undertakings in the district.

For industries whose work sites move from place to place (which include construction, transport and traffic, seafaring, forestry and agriculture), some countries (such as Finland, the Federal Republic of Germany, the Netherlands and Sweden) have used mobile occupational health service units with considerable success. In France, group services have also used mobile units to reach small undertakings.

Strategies for environmental health

Under the leadership of Ministries of Health or Environment the environmental health services are developed at national and local levels. Traditionally this has been the task of sanitary inspection at the local level, which has focussed the attention on the control of water and sanitation hygiene and food hygiene. The modern industrial society has produced new problems of environmental and indoor air pollution, noise, housing, toxic contaminants and wastes, social environment, etc. In most of these problems the target of regulation, control and prevention is the community instead of an individual or a population. Most of the industrialized and developing countries still need strengthening of their environmental health services. The key issue to achieve this objective is the effective intersectoral collaboration between the health sector and the environment sector. The recent trend of combining occupational health and environmental health approaches at the local level, which has been initiated in some industrialized countries, is found to be a new interesting opportunity for strengthening these two closely interrelated areas.

Conclusions

The need of occupational and environmental health is evident in all parts of the world irrespectively of the structure of economy or the social or political systems. The substantive problems and content of occupational and environmental health, however, vary greatly e.g. between the developing and industrialized countries.

International organizations have provided guiding instruments for the development of occupational and environmental health at the national level. Great variation is seen in the practical applications and implementation at the national level. In selection of models for organizing occupational health services several service provision alternatives must be used in order to meet the needs of different types of workplaces, small industries and big enterprises. The development of environmental health services still needs much legislative, educational and organizational efforts in many countries. The strategy of combining occupational and environmental health strategies is an interesting new option.

Literature

International Labour Office, ILO, Convention No 155 concerning Occupational Safety and Health and the Working Environment. International Labour Office, Geneva, 1981.

International Labour Office, ILO, Convention No. 161 concerning Occupational Health Services. International Labour Office, Geneva, 1985.

Concern for Europe's Tomorrow, Chapter 15, Occupational Health (Rantanen, J.)
World Health Organization, Regional Office for Europe, 1994 (in press)

Rantanen, J. (ed.), Occupational Health Services. WHO Regional Publications, European Series No. 26, Copenhagen, 1990.

OECD, Employment Outlook. Organization for Economic Co-operation and Development. Paris, 1989-1992.

World Health Organization, Regional Office for Europe, Environment and Health. The European Charter and Commentary. WHO Regional Publications, European Series No. 35, Copenhagen, 1990.

World Health Organization. Our Planet, Our Health. Report of the WHO Commission on Health and Environment, Geneva, 1992.

World Health Organization, Consultation of Occupational Health Services, Helsinki 22-24, May, 1989, WHO

WHO Alma-Ata Declaration, WHO, Geneva 1978

UNCED Agenda 21