



# Northern Perspectives

Published by the Canadian Arctic Resources Committee

Volume 26, Number 1, Fall/Winter 2000

## Persistent Organic Pollutants: Are we close to a solution?



Photo: Mike Beedell, from *Voices from the Bay*.

### Introduction

By John Crump, Executive Director

This issue of *Northern Perspectives* will help frame the issues to be dealt with when delegations from more than 100 countries meet in South Africa to finalize an international treaty on persistent organic pollutants (POPs).

The articles in this issue explain what POPs are, what they do, and what challenges face those trying to rid the world of these toxic chemicals. In this introduction, I'd like to explain how and why CARC, an organization with a very specific focus on northern Canada, came to be involved in international negotiations in distant countries. "Think globally, act locally," has long been a catchphrase of the environmental movement. We now find ourselves turning that phrase on its head.

The local effects of POPs are potentially devastating to the Arctic environment and peoples. Yet very few of these chemicals are actually generated in the Arctic. Former military bases are small local sources of PCBs, but that's about it. Most of these chemicals—appearing in alarming amounts—are generated elsewhere in the world and brought to the Arctic by wind and water. As anyone who's spent time in the North will appreciate, evaporation rates in the Arctic cold are quite low, so chemicals that migrate north tend to stay and accumulate.

To turn the tide, we must act globally. That's the only way to choke the flow of POPs. CARC has worked in

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# POPs:

## What they are; how they are used; how they are transported

By Clive Tesar

Persistent organic pollutants (POPs) are carbon-based chemical compounds and mixtures that include industrial chemicals such as PCBs, pesticides like DDT, and unwanted wastes such as dioxins. POPs are primarily products and by-products of human industry that are of relatively recent origin. As the name suggests, they are persistent in the environment, resisting degradation through natural processes.

Of all the pollutants released into the environment every year by human activity, POPs are among the most dangerous. They are highly toxic, causing an array of adverse effects, including disease, birth defects among humans and animals, and death. Specific effects can include cancer, allergies, and hypersensitivity; damage to the central and peripheral nervous systems; reproductive disorders; and disruption of the immune system. Many of these effects are intergenerational, present in both affected adults and their children. A study released in August 2000, *The Health of Canada's Children*, published by the Canadian Institute of Child Health, concludes: "Today's children are born with a body burden of synthetic, persistent organic pollutants—the consequences of which will not be known for another 50 years or so."

Although some countries have already banned the use of some POPs because of their demonstrated toxicity, many are still in use in countries around the globe. Russia, for example, has no plans to phase out its use of PCBs in electrical transformers (a once-common

application throughout the developed world) until the useful life of those transformers is over. That could be 2025 or later. There is concern about what will happen if some countries stop using DDT to control malarial mosquitoes. In both cases, wealthier countries must consider assistance to ensure that compliance with a ban on POPs is a reasonable solution. It's a case of enlightened self-interest to do so.

POPs released to the environment can travel through air and water to regions distant from their original source. They travel on wind and water currents, especially through the process of evaporation and redeposition known as the "grasshopper effect." Because Arctic air is cold, evaporation is minimal and POPs tend to accumulate and concentrate in polar regions. For example, levels of lindane, used as a pesticide in China, recorded from the coast of China to the Beaufort Sea show a marked increase near the Arctic. Recent studies have shown high concentrations of POPs are also present in alpine regions.

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partnership with the International POPs Elimination Network (IPEN), a coalition of more than 250 non-government organizations from around the world, to push the Arctic agenda to the forefront of the POPs negotiations. We have also worked in partnership with Aboriginal groups from the Northwest Territories, Yukon, and Nunavut to help ensure that the voices of northern indigenous peoples are heard in this process. The success of this treaty is critical and not only for the POPs issue. If successful, this treaty will set the direction for dealing with other international threats to the Arctic. Those threats include other toxic materials such

as mercury, cadmium, and lead, as well as the looming challenges of global climate change. We expect the ground being prepared by CARC will help ensure a voice in future negotiations for northerners and for others who are interested in maintaining the health and security of the Arctic and its peoples.

I'd like to thank the contributors to this issue of *Northern Perspectives* for lending their time and their thoughts to this important matter: John Buccini, Eric Dewailly, Terry Fenge, and Stephanie Meakin. I'd also like to thank our members and the charitable foundations who continue to make our work possible. ■

How long before things improve in the Arctic depends on when these substances are taken out of production. Substances in use today may take several years to reach higher latitudes. Even if all uses of certain POPs were to stop today, experts believe that it would take approximately 50 years for them to disappear from the Arctic.

“Levels of many contaminants in the Arctic are likely to remain at or close to existing levels for decades because of their resistance to degradation, the slow rate of degradative processes, and the recycling of existing accumulations.”

*Arctic Pollution Issues: A State of the Arctic Environment Report* (Oslo: Arctic Monitoring and Assessment Programme, 1997), p. xii.

## The Dirty Dozen: the twelve POPs covered by the present negotiations

Although many POPs exist, the United Nations Environment Programme (UNEP) has targeted the following for immediate action. The description of each chemical and its properties is adapted from information provided by UNEP.

**ALDRIN**—A pesticide applied to soil to kill termites, grasshoppers, corn rootworm, and other insect pests, aldrin can also kill birds, fish, and humans. In one incident, aldrin-treated rice is believed to have killed hundreds of shorebirds, waterfowl, and passerines along the Texas Gulf Coast when these birds ate either the rice or animals that had eaten the rice. In humans, the fatal dose for an adult male is estimated to be about five grams. Humans are exposed to aldrin through dairy products and animal meats. Studies in India indicate that the average daily intake of aldrin and its by-product dieldrin (see below) is about 19 micrograms per person. The use of aldrin has been banned or severely restricted in many countries.

**CHLORDANE**—Used extensively to control termites and as a broad-spectrum insecticide on a range of agricultural crops, chlordane remains in the soil for a long

time and has a reported half-life\* of one year. The lethal effects of chlordane on fish and birds vary according to the species, but tests have shown that it can kill mallard ducks, bobwhite quail, and pink shrimp. Chlordane may affect the human immune system and is classified as a possible human carcinogen. It is believed that human exposure occurs mainly through the air, and chlordane has been detected in the indoor air of residences in the United States and Japan. Chlordane is either banned or severely restricted in dozens of countries.

**DDT**—Perhaps the most infamous of the POPs, DDT was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. After the war, DDT continued to be used to control disease, and it was sprayed on a variety of agricultural crops, especially cotton. DDT continues to be applied against mosquitoes in several countries to control malaria. Its stability, its persistence (as much as 50% can remain in the soil 10–15 years after application), and its widespread use have meant that DDT residues can be found everywhere; residual DDT has been detected in the Arctic.

Perhaps the best known toxic effect of DDT is eggshell thinning among birds, especially birds of prey. Its impact on bird populations led to bans in many countries during the 1970s. While 34 countries have banned DDT and 34 others severely restrict its use, it is still detected in food from all over the world. Although residues in domestic animals have declined steadily over the last two decades, food-borne DDT remains the greatest source of exposure for the general population. The short-term acute effects of DDT on humans are limited, but long-term exposures have been associated with chronic health effects. DDT has been detected in breast milk, raising serious concerns about infant health.

**DIELDRIN**—Used principally to control termites and textile pests, dieldrin has also been used to control insect-borne diseases and insects living in agricultural soils. Its half-life in soil is approximately five years. The pesticide aldrin rapidly converts to dieldrin, so concentrations of dieldrin in the environment are higher than dieldrin use alone would indicate. Dieldrin is highly toxic to fish and other aquatic animals, particularly frogs, whose embryos can develop spinal deformities after exposure to low levels. Dieldrin residues have been found in air, water, soil, fish, birds, and mammals, including humans. Food is the primary source of exposure for the general population; dieldrin was the second most common pesticide detected in a U.S. survey of pasteurized milk.

**DIOXINS**—These chemicals are produced unintentionally in incomplete combustion as well as during the manufacture of pesticides and other chlorinated substances. They are emitted mostly in the burning of hospital, municipal, and hazardous wastes, but also when burning peat, coal, and wood and in automobile emissions. Of the 75 different dioxins, seven are considered to be of concern. One type was found to be present in the soil 10–12 years after the first exposure. Dioxins have been linked to a number of adverse effects in humans, including immune and enzyme disorders and chloracne, and they are classified as possible human carcinogens. In laboratory animals dioxins caused a variety of effects, including an increase in birth defects and stillbirths. Fish exposed to dioxins died shortly after the exposure. Food (particularly from animals) is the major source of exposure for humans.

“Today’s children are born with a body burden of synthetic, persistent organic pollutants—the consequences of which will not be known for another 50 years or so.”

*The Health of Canada’s Children*  
Canadian Institute of Child Health  
August 2000

**ENDRIN**—This insecticide is sprayed on the leaves of crops such as cotton and grains and is also used to control rodents such as mice and voles. Animals can metabolize endrin, so it does not accumulate in their fatty tissue to the extent that structurally similar chemicals do. It has a long half-life, however, persisting in the soil for up to 12 years. In addition, endrin is highly toxic to fish. When exposed to high levels of endrin in the water, sheepshead minnows hatched early and died by the ninth day of their exposure. The primary route of exposure for the general human population is through food, although current dietary intake estimates are below the limits deemed safe by world health authorities.

**FURANS**—These compounds are produced unintentionally from many of the same processes that produce dioxins and during the production of PCBs (see **PCBs**).

They have been detected in emissions from waste incinerators and automobiles. Furans are structurally similar to dioxins and share many of their toxic effects. The toxicity of the 135 different types varies. Furans persist in the environment for long periods and are classified as possible human carcinogens. Food, particularly animal products, is the major source of exposure for humans. Furans have been detected in breast-fed infants.

**HEPTACHLOR**—Primarily used to kill soil insects and termites, heptachlor has also been used to kill cotton insects, grasshoppers, other crop pests, and malaria-carrying mosquitoes. It is believed to be responsible for the decline of several wild-bird populations, including Canadian Geese and American Kestrels in the Columbia River basin in the United States. The geese died after eating seeds treated with levels of heptachlor lower than maximum levels recommended by the manufacturer, suggesting that even responsible use of heptachlor may kill wildlife. Laboratory tests have shown high doses of heptachlor to be fatal to mink, rats, and rabbits, and lower doses to cause adverse behavioural changes and reduced reproductive success. Heptachlor is classified as a possible human carcinogen, and some two dozen countries have either banned it or restricted its use. Food is the major source of exposure for humans, and residues have been detected in the blood of cattle from the United States and Australia.

**HEXACHLOROBENZENE (HCB)**—First introduced in 1945 to treat seeds, HCB kills fungi that affect food crops. It was widely used to control wheat bunt. It is also a by-product of the manufacture of certain industrial chemicals and exists as an impurity in several pesticide formulations. When people in eastern Turkey ate HCB-treated seed grain between 1954 and 1959, they developed a variety of symptoms, including photosensitive skin lesions, colic, and debilitation; of several thousand who developed a metabolic disorder called porphyria turcica, 14% died. Mothers also passed HCB to their infants through the placenta and through breast milk. In high doses, HCB is lethal to some animals, and at lower levels adversely affects their reproductive success. HCB has been found in all food types. A study of Spanish meat found HCB present in all samples. In India, the estimated average daily intake of HCB is 0.13 micrograms per kilogram of body weight.

**MIREX**—This insecticide is used mainly to combat fire ants, and it has been used against other types of ants and termites. It has also been used as a fire retardant in plastics, rubber, and electrical goods. Direct exposure to mirex



Photo: Mike Beedell, from *Voices from the Bay*.

does not appear to cause injury to humans, but studies on laboratory animals have caused it to be classified as a possible human carcinogen. In studies, mirex proved toxic to several plant species and to fish and crustaceans. It is considered to be one of the most stable and persistent pesticides, with a half-life of as great as 10 years. The main route of human exposure to mirex is through food, particularly meat, fish, and wild game.

**POLYCHLORINATED BIPHENYLS (PCBs)**—These compounds are used in industry as heat-exchange fluids in electric transformers and capacitors and as additives in paint, carbonless copy paper, and plastics. Of the 209 different types of PCBs, 13 exhibit a dioxin-like toxicity. Their persistence in the environment corresponds to the degree of chlorination, and half-lives can vary from 10 days to one-and-a-half years. PCBs are toxic to fish, killing them at higher doses and causing spawning failures at lower doses. Research also links PCBs to reproductive failure and suppression of the immune system in various wild animals, such as seals and mink.

Large numbers of people have been exposed to PCBs through food contamination. Consumption of PCB-contaminated rice oil in Japan in 1968 and in Taiwan in 1979 caused pigmentation of nails and mucous membranes and swelling of the eyelids, along with fatigue, nausea, and vomiting. Due to the persistence of PCBs in their mothers' bodies, children born as many as seven

years after the Taiwan incident showed developmental delays and behavioural problems. Similarly, children of mothers who ate large amounts of contaminated fish from Lake Michigan showed poorer short-term memory function. PCBs also suppress the human immune system and are listed as probable human carcinogens.

**TOXAPHENE**—This insecticide is used on cotton, cereal grains, fruits, nuts, and vegetables. It has also been used to control ticks and mites in livestock. Toxaphene was the most widely used pesticide in the United States in 1975. As much as 50% of a toxaphene release can persist in the soil for as long as 12 years. For humans, the most likely source of toxaphene exposure is food. While the toxicity to humans of direct exposure is not high, toxaphene has been listed as a possible human carcinogen due to its effects on laboratory animals. It is highly toxic to fish; brook trout exposed to toxaphene for 90 days experienced a 46% reduction in weight and reduced egg viability, and long-term exposure to levels of 0.5 micrograms per litre of water reduced egg viability to zero. Thirty-seven countries have banned toxaphene, and 11 others have severely restricted its use.

*Clive Tesar is an Ottawa-based communications consultant. He has worked on the issue of persistent organic pollutants for the past year.*

Endnote: \*Half-life: the time required for a material to degrade to half its initial value ■

# What's New with POPs Research in the Arctic?

By Stephanie Meakin



*Photo: Mike Beedell, from Voices from the Bay.*

## The List

Not new is the initial list of 12 POPs—"the dirty dozen" (DDT, heptachlor, toxaphene, mirex, aldrin, endrin, dieldrin, chlordane, hexachlorobenzene, PCB, dioxins, and furans)—that will be subject to the final articles of elimination, reduction, and control mechanisms agreed upon through the UNEP-sponsored Global Convention on Persistent Organic Pollutants. The 12 substances have been used for decades and continue to be used in many countries despite the growing body of evidence that they are harmful to living organisms, including humans. What is new is that this list may soon be expanded.

A process for adding substances to the Convention based on persistence, bioaccumulation, toxicity, and the potential for long-range transport can be found within the draft text. New substances must meet a series of scientific criteria before being considered. In August 2000, UNEP-Chemicals Branch announced a \$5-million study, funded by the Global Environment Facility (GEF), that is expected to look beyond the more commonly known list of 12 POPs. Paul Whyllie, currently registrar of Jamaica's Pesticides Control Authority, will manage the two-year attempt to close the information gap on further POPs of concern. But what substances should be looked at next?

In the Arctic, the new pollutants of concern may include brominated flame-retardants, polychlorinated naphthalenes (PCNs), coplanar PCBs, short-chained

chlororoparaffins, current-use pesticides, pesticide enantiomers, chlorinated phenols, and haloacetic acids. Any POP in use today will be present in the Arctic; we can only confirm the presence of the ones we actively look for.

## Transport

POPs are important to Arctic residents because they move north via air currents and, because of their chemistry, tend to accumulate in the fatty tissue of animals and people. Until recently there were few tools to link a source (i.e., a facility, chemical plant, or activity) to the rate of deposition in the Arctic. Dr. Barry Commoner and his staff at the Center for the Biology of Natural Systems at Queens College, City University of New York, developed a model to track dioxin from facilities and activities in Canada, the United States, and Mexico to eight Arctic communities. Data obtained from government dioxin inventories identifies individual sources or facilities, making it possible to calculate the contribution of each to a particular receptor. A community affected by contamination levels at that receptor could then contact the facilities responsible for the greatest percentage and ask them to stop emissions.

Tools such as this are required to effectively direct scarce remedial dollars and develop policies to achieve the highest rates of emission reduction possible. The importance of this work was reinforced in the recent draft U.S. Environmental Protection Agency's reassessment of the

toxicity of dioxin. That report states that dioxin is 10 times more toxic than previously believed and brings into question the current “safe levels” set by governments—including Health Canada. Mounting scientific evidence suggests that exposure to even very low concentrations of dioxin may be a concern to people.

### **Substance-specific Health Studies— The Latest Data and Results**

Recent studies conducted for the Northern Contaminants Program (NCP) have reported that traditional foods contain high levels of vitamin C and folic acid and are excellent sources for vitamins A and E, several essential minerals, and n-3 fatty acids. The importance of traditional, or “country,” foods to Inuit is not only nutritional but also cultural, social, and economic. Unfortunately, the foregoing studies also reported that these same foods contain multiple contaminants. Of greatest concern are toxaphene and chlordane, the mean intakes of which were found to be four times greater than the tolerable daily intake (TDI) value set by Health Canada. Another NCP study recently reported that calculations using new risk assessment models indicate that levels of chlordane in the Inuit diet may pose a greater risk to people than previously determined when calculating tolerable daily intakes.

Other studies conducted for the NCP report an inverse correlation between vitamin A and PCB body burden; as the PCB levels increase in people the levels of vitamin A decrease. Further evidence suggests that exposure to mixtures of organochlorine substances reduces the antibody response following vaccination. This suggests that these chemicals can affect our ability to fight disease—in essence, weaken our immune system.

Clearly, more research on the effects of the levels of contaminants found in the Arctic and in traditional foods is needed.

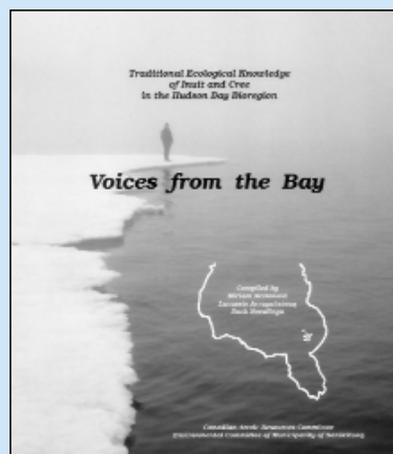
### **Levels of Certain Contaminants: Are They Increasing or Decreasing?**

The average concentration of endosulfan in the Arctic has not changed significantly during the last five years; however, total chlordanes measured in various Arctic environmental media are decreasing, but slowly. Dieldrin found in Arctic air and water samples has not shown much decrease, despite world production ceasing in 1991. Toxaphene levels are decreasing in the Arctic air, but levels in water remain unchanged. This

could mean that as the concentration of toxaphene in the air decreases, the toxaphene in water may remain a source for some time into the future.

It is only through the sterling efforts of the scientists and community members involved in state-of-the-art research through the NCP that we have an idea of what is going on. Continued monitoring of the levels of old and new contaminants in Arctic air, water, animals, and people is crucial if we are to know if domestic and international controls and instruments are working to reduce the levels of these contaminants and safeguard the unique Arctic environment and the health of Arctic residents.

*Stephanie Meakin (smeakin@attcanada.ca), a biologist, has worked as the technical advisor for the five northern aboriginal organizations on POPs and contaminant issues for the past four years.* ■



“For generations, Cree and Inuit Elders have passed on their knowledge of animals and the environment to their sons and daughters to enable them to support their families.

“This book is dedicated to those teachings and to the Elders, hunters, and trappers who have come forward... to record and share their traditional ecological knowledge.”

Copies available from CARC: \$19.95

# Indigenous Peoples and Global POPs

By Terry Fenge

Although few in number, Inuit and other indigenous peoples in the Arctic have influenced international negotiations towards a global convention on persistent organic pollutants (POPs) out of all proportion to their numbers through research, public education, and co-ordinated advocacy and lobbying. This fact is important internationally, for what they have done in the global POPs process—to the benefit of all Canadians—can be repeated in other global environmental negotiations that address Arctic concerns such as climate change, ozone depletion, and perhaps even biodiversity conservation.

In particular, the Canadian federal government should learn an important lesson: northern indigenous peoples lobbying from their unassailable high moral ground can, in partnership with the federal agencies, achieve foreign policy objectives that Canada alone may not.

The full story of the involvement of northern indigenous peoples in the global POPs process cannot be written until the POPs convention is finalized, ratified, and implemented, and this may take some years. The story to date is an unusual mix of domestic and circumpolar research and policy, leading to global action.

## Establishing The Northern Contaminants Program

In the late 1980s blood and fatty tissue samples taken from Inuit in southern Baffin Island and northern Quebec showed surprisingly high levels of certain persistent organic pollutants (POPs), including PCBs and DDT. These unexpected results raised red flags among the research, public health, and policy communities and Inuit organizations. It was suspected at this early date that long-range transport of contaminants from tropical and temperate countries to the Arctic, followed by their bioaccumulation in the food web—particularly in the fat of marine mammals subsequently consumed by Inuit—explained the presence of these toxins.

To better understand the nature and extent of the issue, the federal government put in place the Northern Contaminants Program (NCP), a component of its 1990 Green Plan. This programme sponsored research by university and government scientists and established the



*Sheila Watt-Cloutier, President, Inuit Circumpolar Conference Canada and Vice President, Inuit Circumpolar Conference, speaking at global POPs negotiations, Nairobi, Kenya, February 1999*

Centre for Indigenous Peoples' Nutrition and the Environment (CINE), at McGill University in Montreal, to focus on diet-related research in close collaboration with indigenous peoples. Five indigenous peoples' organizations (Inuit Circumpolar Conference Canada, Inuit Tapirisat of Canada, Dene Nation, Metis Nation–NWT, and the Council for Yukon First Nations) were welcomed

into a partnership with the territorial governments and four federal agencies (Indian Affairs and Northern Development, Environment, Fisheries and Oceans, and Health) to manage the NCP.

This highly unusual arrangement reflected, in part, the unfortunate reaction in the late 1980s by some Inuit to the clumsy and misleading release of the initial research data. To shy away from eating country food and stop breast feeding their infants because of exaggerated reports in the media about the research results seemed a cure more harmful than the disease and graphically illustrated the need for indigenous peoples' organizations to be fully involved in the programme so that they could interpret and explain research results to their constituents. Staff in the Department of Indian Affairs and Northern Development (DIAND), perhaps motivated by their fiduciary relationship with indigenous peoples, recognized the need early in the programme for full involvement of indigenous peoples' organizations, acknowledging that few federal agencies enjoyed a reputation for public service in the communities. It is also important to point out that as POPs in the Arctic became an issue in the late 1980s and early 1990s, environmental concerns nationally were at the top of the political agenda, peaking at the 1992 Earth Summit in Rio de Janeiro in which Canada attempted to play a major role. In short, the timing was right for a major research initiative on POPs.

## A Circumpolar Arctic Dimension

At the same time that POPs contamination in the Canadian Arctic was being recognized as an issue, the eight Arctic states were negotiating a circumpolar Arctic Environmental Protection Strategy (AEPS), initiated in 1991. While designed primarily to bind the Federation of Russia into co-operative environmental research and management arrangements, the flagship component of this strategy—the Arctic Monitoring and Assessment Programme (AMAP)—set about measuring and analyzing contaminants throughout the circumpolar region. Both the NCP and AMAP would publish path-breaking reports in 1997 urging the international community to conclude new agreements to eliminate and better manage key POPs. The initial chair of AMAP was a well-respected Canadian civil servant who was able to strengthen links between the NCP and AMAP. Surprisingly little data were available from Alaska and large portions of the Russian Federation. Nevertheless, following searching peer review, research

sponsored through these programmes entered quickly into the public realm in journals and articles, well before the 1997 compendium volumes.

## Towards a Regional Agreement

Armed with this data the Government of Canada, assisted by certain other Arctic states, particularly Sweden, persuaded the United Nations Economic Commission for Europe (UNECE)—whose member states are from North America, eastern and western Europe, and the former Soviet Union—to sponsor negotiation of a POPs protocol to its existing acid rain convention, the 1979 Convention on Long-range Transboundary Air Pollution (LRTAP). This process, to address 15 named POPs, commenced in 1995 and an agreement, finalized and signed in 1998, currently awaits ratification by sufficient states to enter into force.

Having worked closely together in the NCP, the five indigenous peoples' organizations had developed a clear understanding of the POPs issue—to them a very serious matter of health, nutrition, and culture, not just environment. This was hardly surprising, for laboratory work showed long-term POPs effects on human reproductive, neurological, behavioural, intellectual, and endocrine systems. To operate on the international stage these groups formed the Canadian Arctic Indigenous Peoples Against POPs (CAIPAP) and, using modest funding provided by the NCP and supplemented by the Department of the Environment, flew to Geneva to influence events.

The coalition politely elbowed its way into the negotiating room using the Inuit Circumpolar Conference's (ICC) official observer status to the United Nations Economic and Social Council. Predictably, observing from the back of the room was frustrating, particularly when the only additional observers represented the chemical industry. Nevertheless, considerable sympathy for Arctic concerns was voiced by Denmark, Norway, and Sweden, and all in the room were prepared to listen to and read interventions by ICC Canada and the coalition. Experience in Geneva has already been reported in some detail in *Northern Perspectives* (25:2, Winter 1998).

Joining when these negotiations were half completed, the coalition was unable to significantly influence events although it was successful in having preambular language adopted that referenced, in particular, the effects of POPs in the Arctic and the health concerns of indigenous peoples. The coalition did, however, have a lasting impact on the Canadian delegation through its insistence that the

concerns of Arctic indigenous peoples be fully reflected in the position of the Government of Canada. That this was not automatically the case given the extensive NCP-funded research in northern Canada and the government's earlier and successful efforts to get POPs onto the UNECE agenda came as a surprise to the coalition, as did the obvious disagreements among agencies represented on Canada's delegation.

Economic development agencies and those charged with protecting the environment and public health did not always pull in the same direction. For example, the coalition was dumbfounded to learn that the Pest Management Regulatory Agency (PMRA), a member of Canada's delegation, was unable to share basic health-related information about the pesticide lindane with other delegation members or ICC Canada; this was deemed by legislation to be proprietary to industry! Yet research by CINE reported in the Canadian Arctic Contaminants Assessment Report (CACAR) and AMAP suggested that as many as 15% of Inuit women in southern Baffin Island were exceeding the tolerable daily intake of lindane. Subsequent written promises to ICC Canada by the minister of Health to amend the legislation have come to naught. Most significantly, however, the coalition's involvement in these regional negotiations set the scene for it to be deeply and fully involved in subsequent global negotiations.

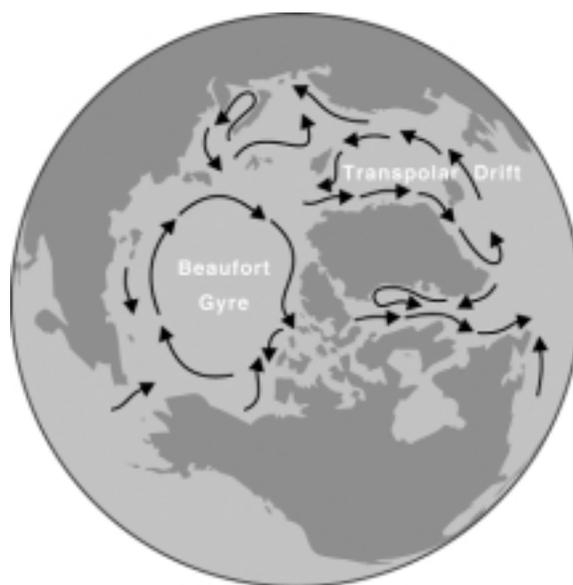
## Towards a Global Agreement

In 1995 Canada was instrumental in persuading the Governing Council of the United Nations Environment Programme (UNEP) to sponsor international negotiations towards a new, legally binding convention on POPs. Negotiations commenced in Montreal in summer 1998 and the following two years saw sessions in Geneva, Nairobi, and Bonn. The coalition was present at and intervened in all sessions and will be present at the December 2000 negotiating session in Johannesburg.

At the beginning of this process, the coalition adopted a basic position seeking a comprehensive, verifiable, and rigorously implemented convention to protect the health and way-of-life of northern indigenous peoples. These principles were supported by the coalition's technical analyses that the convention should commit to POPs elimination rather than perpetual management and that generous financial and technical assistance be provided to developing countries to enable them to live up to obligations and duties in the convention. As well, the coalition developed positions on destruction of stockpiles, import and export controls, and detailed other features of a "model" convention. Legal advice from consultants from the Faculty of Law at the University of Calgary suggested the convention include language similar to arms-control treaties promoting monitoring and verification. From the onset of



➔ Dominant Air Currents



➔ Surface Ocean Currents

From *Highlights of the Canadian Arctic Contaminants Assessment Report: a community reference manual* (Ottawa: DIAND, 1997), pp. 38, 40. Courtesy of DIAND.

negotiations, the coalition was concerned that many states in the developing world would sign the convention with a political flourish but fail to implement it.

The chair of the negotiations, a Canadian with the federal Department of the Environment, proved skilled in environmental diplomacy; as many as 130 countries were represented in negotiations. With the coalition operating once again from the back of the room and allowed to make only general interventions in plenary sessions, the chair generously acceded to requests from the coalition to intervene at strategically important moments. Sheila Watt-Cloutier, President of ICC Canada and Vice-President of ICC—an Inuk from Kuujuaq in Nunavik (northern Quebec) and a gifted public speaker able to convey technical information to a large audience and to do so “from the heart”—attended all negotiations. Political representatives of the Council for Yukon First Nations (CYFN) also attended and intervened at key sessions.

The coalition’s position was reasonable, technically well thought out, and consistently advocated by a skilled political spokesperson and public speaker appealing to the world on behalf of relatively few people, but those clearly at risk. That Inuit and other Arctic indigenous peoples were “exotic” to most of the participating states and were listened to with curiosity added to the influence wielded by the coalition.

Unlike the regional LRTAP negotiations, the global process attracted the attention of many environmental, public health, and public-interest organizations, including Greenpeace and the World Wide Fund for Nature from the United States and CARC from Canada. At the lead of the Washington-based Physicians for Social Responsibility, many non-government groups, including indigenous peoples’ groups from the United States, came together in the International POPs Elimination Network (IPEN). CAIPAP did not join this network, preferring instead to participate in IPEN’s events but to remain independent. IPEN brought significant intellectual and financial resources and media savvy to the POPs negotiations, holding two-day workshops and conferences in each negotiating venue immediately before formal negotiations. These events, which also featured street theatre and cheerful but peaceful protests, galvanized media attention. CAIPAP was able to use the media attracted by IPEN and WWF to great effect. For example, wire stories from the first negotiations in Montreal featured Inuit almost to the exclusion of other groups affected by POPs.

The coalition learned a great deal from this first event: In the POPs context, Arctic indigenous peoples are newsworthy in European capitals. In subsequent negotiations the coalition sought to “press the envelope.” Indigenous peoples’ dance troupes from Nunavut and Yukon performed before the negotiators at an evening event in Bonn, generating an opportunity for political representatives from CYFN and ICC Canada to speak directly and pointedly to all involved, an opportunity not provided in the formal negotiations themselves.

**“...imagine for a moment if you will the emotions we now feel...as we discover food which for generations nourished us and keeps us whole physically and spiritually, is now poisoning us.”**

*Sheila Watt-Cloutier, President, ICC Canada and Vice President, ICC, International Negotiating Committee regarding the Need for a Global Treaty on Persistent Organic Pollutants, Montreal, 29 June 1998*

Larissa Abrouitina, a Chukchi and medical doctor from Chukotka in the Russian Far East and Vice President of the Russian Association of Indigenous Peoples of the North (RAIPON), joined the coalition in Nairobi. She spoke convincingly of the health concerns of the 200,000 indigenous people in the Russian Arctic. At the request of the coalition, the Canadian delegation included among its members an aboriginal woman from Yellowknife well-versed in contaminant issues. Breaking from the LRTAP format, representatives of industry and environmental groups were also included on Canada’s global POPs delegation.

One event seems to illustrate well the informal influence the coalition has been able to exert. During the negotiations in Nairobi, UNEP sponsored an evening reception at its headquarters. Sheila Watt-Cloutier spoke to all, appealing to their good will, and presented Mr. Klaus Topfer, Executive Director of UNEP, with an Inuit carving of a mother and child. Mr. Topfer, ex-minister of the environment for Germany, immediately passed the carving to the chair of the POPs negotiations. He then gave an “off the cuff” speech suggesting that indigenous

peoples symbolized by the carving were the “conscience” of the negotiations and that the world was obliged to take their concerns seriously. This carving now sits at the head table occupied by the chair. He told the coalition that during times of national posturing and puffery, inevitable in international negotiations, he looks at the carving to remind himself of the true nature of the issue. This carving is now centrally featured on the UNEP POPs Web site (<http://www.unep.org>).

**“That Inuit mothers—far from the areas where POPs are manufactured and used—have to think twice before breast feeding their infants is surely a wake-up call to the world.”**

*Sheila Watt-Cloutier, President, ICC Canada and Vice President, ICC, International Negotiating Committee regarding the Need for a Global Treaty on Persistent Organic Pollutants, Montreal, 29 June 1998*

At one stage, the coalition seemed to be doing too well; its message and concerns were overly dominating media coverage. Nevertheless, it repeatedly made connections with peoples and groups from around the globe. This was important, for if the convention is to help the Arctic, developing countries must be full participants in its implementation. In response, the coalition sought to link long-range transport of POPs to the Arctic, resulting in chronic health concerns of indigenous peoples who eat country food, with acute health concerns of women, children, and workers in tropical and temperate countries as a result of fields sprayed with offending pesticides and insecticides.

That such a strategy was needed—essentially portraying the issue as a health concern rather than an environmental concern, and POPs as the connector between disparate groups worldwide—was important. At one stage, developing countries, aided by some public-interest groups, balked at DDT being included in the convention. While banned in Canada for many years, DDT is used in tropical countries as a vector control for malaria, saving the lives of thousands of people every year. Just as this issue threatened to destabilize negotiations along all-too-familiar north-south lines, Sheila Watt-Cloutier

compellingly informed the assembled negotiators that Inuit would refuse to be party to a convention that threatened the health of others. The coalition wanted only a “win-win” solution. Such selfless remarks bridged rather than exacerbated the north-south divide. UNEP’s Secretariat told ICC Canada behind the scenes that this sort of intervention was most helpful.

As the process continued, key issues emerged: financing the convention and provisions for technical assistance for developing countries. Canada played a very positive role in these debates. Authorized by the February 2000 federal budget, Canada’s chief negotiator from the Department of Foreign Affairs and International Trade (DFAIT) was able to announce CAD 20 million to assist convention implementation. This money was almost immediately transferred to the World Bank for distribution to developing countries and those with “economies in transition.” Canada also organized informal meetings of donor countries to persuade them to announce funding support.

The role of the Global Environment Facility (GEF) in financing convention implementation became a central feature of debate. Established as a result of the 1992 Earth Summit, the Washington-based GEF finances the “incremental” costs of delivering “global benefits” through national projects related to international conventions including those on climate change and conservation of biological diversity. GEF offered to establish a programme to fund POPs projects. This offer was not immediately accepted by the developing world, which claimed GEF to be overly bureaucratic, difficult to access, and dominated by donor countries. Instead, they suggested a new multi-lateral fund for POPs projects similar to that included in the Montreal Protocol on Ozone Depletion.

While sympathetic to the developing world but mindful of the fact that Europe, Japan, and North America would pay the piper and call the tune, the coalition spoke of the need for substantial and stable funding and transparent processes to allow timely access. At an August 2000 meeting of Arctic parliamentarians in northern Finland, Sheila Watt-Cloutier appealed successfully to Mohamed El-Ashry, Chief Executive Officer of GEF, to personally attend the last POPs negotiations in South Africa to explain how GEF would accommodate POPs as a granting theme and reform itself in response to widely voiced criticism. Once more, the coalition’s intervention was widely supported and seen to be universally helpful.

As the world's only superpower, the United States is important in any global negotiations, including POPs. An Arctic state with Inuit and other indigenous peoples resident in Alaska, it might be expected to support a strong global convention as advocated by the coalition, yet this has not proven to be the case. American intransigence created difficulties for Canada, which invariably seeks positions in close accord with its giant southern neighbour.

Following three negotiating sessions, the United States sent a diplomatic note to the European Union about the state of play. Leaked in Europe, this note suggested POPs was not truly a global issue but rather a regional matter. As a result, it was suggested that the developing world should agree to pay much of the clean-up costs to implement the convention. An Alaskan or broader Arctic dimension was absent from this analysis. This position seemed reflective of U.S. difficulties to commit to help fund the convention in advance of Congressional consideration. That the United States was in arrears in its contribution to GEF was an additional factor.

Following an oral repetition of its position in Bonn, the president of ICC Alaska wrote to the U.S. Secretary of State seeking clarification and reminding her of Arctic concerns. The reply was less than reassuring. Simultaneously, indigenous and non-indigenous interests in Alaska were preparing proposals for an Alaska contaminants programme modelled, in part, on Canada's NCP. Concern about the U.S. position in the global POPs negotiations was a contributory factor. At the October 2000 Arctic Council (which replaced the AEPS in 1996) ministerial meeting in Barrow, Alaska, the Governor of Alaska issued a hard-hitting press

release urging the United States Government to support a strong global POPs convention and to sponsor badly needed POPs research.

Almost simultaneously, the Montreal-based Council for Environmental Co-operation, a body set up through the North American Free Trade Agreement, provided a computer study of long-range transfer to eight communities in Nunavut of dioxins released to the environment by industrial and waste incineration facilities. The study concluded that the vast majority of dioxins in Nunavut came from the mid-west and eastern seaboard of the United States. Once more, this study illustrated the vulnerability of the Arctic to contaminants released far to the south. Sheila Watt-Cloutier participated in the study's release in New York, and once more the Inuit and Arctic dimensions to the issue were central components of Reuters and AP wire stories picked up worldwide. All of this added to pressure on the United States Department of State to take a more forward-looking and conciliatory position.

While Canada's position was always more enlightened than that of the United States and more in tune with the concerns of indigenous peoples, the coalition faced many hours of collegial debate with civil servants and occasional meetings with ministers of Environment and Health to strengthen it. It urged Canada to shift its position from that of the mutually supportive bloc including Japan, Australia, New Zealand, and the United States to resemble more closely that of Norway, Denmark, and the European Union. Language in the political declaration adopted by Arctic Council ministers in Barrow, promising close co-ordination in international negotiations when



*Photo: Mike Beedell, from Voices from the Bay.*

Arctic interests are at stake, buoyed the coalition. But on issues such as access to information, import and export controls, and ultimate elimination, Canada felt itself unable to move substantially, noting that domestic policy and legislation as well as Cabinet-approved instructions precluded much movement.

Throughout the first two years of global negotiations, significant domestic and legislative debate on contaminants was under way on the Canadian Environmental Protection Act (CEPA). ICC Canada and ITC presented well-received briefs to committees of both the House of Commons and the Senate and participated in the annual Parliamentary EcoSummit. Parliamentarians appreciated the coalition's ability to draw together domestic policy and Canada's international position. Indeed, these activities resulted in parliamentarians exercising commendable oversight of Canada's negotiating team. Not only were Canada's negotiators subject to examination by the House of Commons Standing

Committee on Sustainable Development, but parliamentarians attended the negotiations in Bonn to look over their shoulders.

As of this writing—November 2000—it remains unclear whether a global POPs convention will be concluded and whether its provisions will be sufficiently strong to address the health concerns of Inuit and other indigenous peoples in the Arctic. Members of the coalition are scheduled to meet Nelson Mandela during the last negotiations in South Africa and to ask him to lend his extraordinary, global moral authority to the cause. Whatever the results of the three-year global POPs odyssey, indigenous peoples from northern Canada have played a substantial role internationally in attempting to protect their health, economy, culture, and way of life and the natural environment upon which we all depend.

*Terry Fenge (tfenge@cyberus.ca) is an Ottawa-based consultant. From 1996 to 2000 he was Director of Research for ICC Canada, a founding member of Canadian Arctic Indigenous Peoples Against POPs.* ■

## How Strong is Canada's Commitment to a POPs Treaty?

By John Crump

We had hoped Canada's Minister of the Environment, David Anderson, would answer that question definitively in this issue of *Northern Perspectives*. However, the federal election was called, invoking the practice of ministers not to make official pronouncements during an election campaign.

We had asked the minister to address some significant questions about Canada's position as we head into this last round of negotiations:

- We wanted to know what the minister thought of backing firmer language on the goal of ultimately eliminating POPs.
- We wanted to know if the government would support a stronger placement of the precautionary principle in the treaty. This would help prevent new POPs from being introduced to a world environment already carrying a heavy burden.

- We were curious which area of government was driving Canada's negotiating agenda: Was it the Department of the Environment or was it the Department of Foreign Affairs and International Trade?

Because of the election call, we will almost certainly not know the answers to these questions before the coming round of negotiations in South Africa. What we can—and will—do now is watch for any political pronouncements during the election campaign and question the officials who implement the political direction they are given.

CARC will continue to work to make sure that the POPs treaty has as its goal elimination of these chemicals. We will push the government to take a strong, unequivocal stand on this issue.

# Looking to South Africa:

An interview with John Buccini, Chair, INC Process

*John Buccini is Director, Commercial Chemicals Branch, Conservation and Protection, Environment Canada. For the last two years, he has been chairing the Intergovernmental Negotiating Committee set up by the United Nations Environment Programme. His task is to ensure that the 120 or so countries negotiating a POPs treaty get the work done on time and on target. CARC caught up with him in Ottawa as he was preparing for the final negotiating session, scheduled for December 2000 in South Africa. He spoke recently with Clive Tesar.*



*Photo: Mike Beedell, from Voices from the Bay.*

## **What would you say are the major challenges that remain?**

In my view there are two major challenges: first, to get the control provisions right and to gain agreement to them; and second, to deal with the technical assistance and financial mechanisms aspect of the convention. It's my belief that if we don't have these issues solved then we really don't have the basic elements for the treaty. A third area—on the assumption that we get the two major chunks sorted out—includes a number of administrative or procedural aspects of the convention that will still prove tricky to get resolution on. These relate to how many countries must ratify the convention before it comes into being. Currently the number is 50, and people want to debate—40, 50, 60, 70; we could spend hours on that. So you see, we don't have a treaty until everything's solved, but to me the two major building blocks are the controls and the assistance elements. Once those look like they're in place, we can really focus in on making the treaty administratively smart, or workable.

## **Could you further explain the “control” aspect?**

We have three or four basic elements. First, there is the elimination of use of intentionally produced POPs. Although I think the INC (Intergovernmental Negotiating Committee) is pretty much in agreement with the objective of elimination for intentionally produced POPs, we still have two issues to resolve: one is the use of DDT—how and under what conditions it might be phased out or eliminated—and the other is PCBs. The INC supports an elimination objective for production, but we still have to face up to the fact that there's a lot of PCBs still in use, so we must address how and under what conditions PCB use would be phased out.

Secondly there are the by-products and contaminants issues with dioxins, furans, etcetera, which have two elements. One is to find the controls that could be agreed upon. There seems to be support for having parties develop action plans that would see reductions in releases of dioxins and furans, but there are some thorny issues about acceptable language for the objective that will guide the

by-products part of the convention. As you're probably aware, the language question is whether it's elimination, virtual elimination, or elimination modified by "where practical and feasible." This goes to political policy and signalling, and I expect there will be rather interesting discussions around those language issues.

After that, there are measures for new chemicals, new industrial chemicals, and pesticides. There are policy points on getting countries with new chemicals programmes to introduce screening to identify POPs in new chemicals and avoid the introduction of these new chemicals. There's also a policy point promoting countries' use of existing chemical-review mechanisms, whether for industrial chemicals or pesticides, to identify materials with POPs properties (in addition to the twelve the treaty currently treats) and take actions to deal with them consistent with the convention intent.

There's another point on waste, and how to handle the waste. That's a bit of a thorny issue because we need to ensure consistency with other international treaties, such as the Basel Treaty. So there's no shortage of issues in this one basket. Each one has to be resolved within its own little policy sphere.

### **Is there a question about the precautionary principle wrapped into the control issues as well?**

Yes. There will, I think, be a rather energetic debate on the precautionary principle, precautionary approach, and where and how to reflect the elements of it in the convention. There currently is mention made of it in the preamble and some parties or some countries have indicated that they also want to see it in the "objective" statements found in article "b" (of the draft treaty), and others have said they want to see it embedded in article "f," which deals with the selection procedure for the addition of new POPs to the treaty. So I expect there'll be an interesting discussion on that.

### **That brings us to the second issue you identified as major—financial and technical assistance. There was intersessional work on that. Do you think it's gone far enough to come to fruition at the next INC?**

I'll make a general statement first, then come back to the technical assistance. My sense is that INC5 (the December meeting in South Africa) should be the final meeting. We planned for it to be the final meeting. There

is no mandate, no money, no time, and, in my view, no need for a meeting after this one. All the elements are on the table, and if negotiators truly negotiate instead of merely restating past positions—by that I mean they actually iterate and work for a resolution or a compromise type of text—then we should be able to solve all the issues. It's pretty much up to the 120 country representatives who come to the meeting. I can merely facilitate their discussions and try to nudge them a bit, but it's very much up to them to solve these things.

On the question you posed on financial and technical assistance, the meeting in June in Switzerland was, in my view, a very well conducted meeting in the sense that 18 country representatives were really there as experts, not as country spokespersons. The ground rules for the meeting were such that there was no negotiation to take place. So you've got 18 negotiators in a room and you tell them that they can't negotiate for three days, and yet they're to discuss a topic that is subject to a negotiation, so this was a considerable challenge. My take was that we had a very collegial three days together, where in a low-key atmosphere the participants were able to explain in much more detail what was behind positions that had been exchanged in the previous three or four meetings. And I think there's now a much better understanding of what really is on the minds of the various proponents of different positions and why. Towards the end of the meeting, I thought I was seeing some tentative olive-branch types of ideas beginning to surface. So given the constraints on the meeting, I think we did make progress, certainly in gaining a much better understanding of what's really involved. It's one thing to hear a sound bite like, "we're for this" or "we're against this," but to try to really understand what's on peoples' minds—why the position, what's behind it—goes down to the 2nd or 3rd level.

So I think we are set up for INC5 to make progress. I got a number of suggestions from the participants on how to handle the discussions at INC5 that I'm accepting. For example, we will open on article "k" on financial mechanisms the afternoon of the first day, because we'll need lots of discussion in plenary. It's a subject that hasn't had as much plenary time as, for example, controls. So I will open it on the Monday, and we will open it repeatedly. I hope by Wednesday, Thursday, or Friday, we'll start seeing it come to fruition. So if we can run the two tracks—controls and financial mechanisms—and perhaps alternate the discussions through the days, I think we'll be able to bring them closer together. I believe ultimately it's going to be the package of controls plus financial mechanisms that makes this process come together. ■

# Confirming the Effects of Contaminants on Inuit Children

An interview with Eric Dewailly

*Eric Dewailly is a public health officer with the Quebec government. He is also one of the foremost researchers in the field of connecting the effects of POPs and other contaminants to human health in the Arctic. Together with colleagues from Laval University and other educational institutions, he has conducted most of his research in the Inuit communities of Nunavik in northern Quebec. He spoke recently with Clive Tesar.*

## **For those who aren't familiar with it, could you give us a brief overview of your work?**

First I should say that I entered this field of study—the presence of contaminants in the Arctic—by chance. In 1985 I was conducting a provincial survey on POPs in breast milk in Quebec women. A friend, who was a midwife in a Hudson Bay community, encouraged me to complete the profile with breast milk from Inuit women. At that time, I thought it would be a good idea to have pristine milk. When the lab called me after analyzing the results, I thought there was something wrong, that we probably had external contamination in the lab, but in sample after sample it appeared there was a real problem with the breast milk.



When we first saw the results we realized that the first and biggest issue was about breastfeeding. Breastfeeding is very special, because the mother can do something: she can stop breastfeeding. If I tell you that the levels of PCB or DDT in your adipose tissue are high, you can do nothing; but with breastfeeding, you can do something. So we decided to focus our attention on that issue, to

find out if it is good for the baby to be breast-fed by an Inuit woman with such a level of exposure. The first question was: Is the contamination of breast milk harmful to babies in terms of infection and the immune system? After that, there were questions about adults and about the whole population. And, where were all these contaminants coming from, which part of the food? Also, what is the level of exposure in the whole population? So we did a big population survey in Nunavik (northern Quebec) with 500 participants; about 1 in 7 of the total population. We assessed a broad spectrum of POPs and looked at the dietary question to see if any pattern of consumption was associated with any exposure pattern. From this study we were able to say 50% of the exposure is coming from beluga, 20% from lake trout, and so on. It was quite useful, because with this information we could inform the population that contaminants were mainly in certain foods, so it's not all foods, just a few items, that contribute the most exposure. I think that informing the people about the source of the risk is the first part of good risk management; you give people the tools to decide what they want to do. When individuals can control the risk, it's much better for their mental health.

Once we had settled the question of exposure in the general population, and from where the contaminants were coming, in 1992-93 we decided to look at the pre-natal period—the foetus—because scientific literature suggests that the most susceptible and dangerous period is during the first trimester of pregnancy. In 1993, we started a four-year monitoring programme to measure all cord blood in Nunavik. That really started the larger programme we have on health effects. I think that we now have enough information on who is exposed, the levels of exposure, and the source of the contaminants,

and we will start to look, in two or three years, at what we expect to be the main health effects. We decided to focus on children and not to look at health effects on adults because we still think the young children are the most susceptible. We are especially interested in two possible health outcomes: the first is neuro-behavioural deficiency; the second is immune system and infections. To this end, we started in 1996-1997 a very broad cord study, funded by the Northern Contaminants Program and the (U.S.) National Institute of Environmental Health Sciences. This study of about 300 babies includes people in Greenland and will be finished in about 18 months. We followed the infants from a year after birth, measuring hundreds of variables.

We're also doing some experimental work, using animal models—pigs—to look at any effect on the reproductive tract using a mixture of contaminants that mimic what you find in seal blubber, for example.

I mentioned that between 1993 and 1996 we measured the contaminants in the umbilical cord blood of 500 babies. We'll investigate the medical files of these children to look at four or five years of records, to see about the infections and how many they've had during five years of life. And we'll do the same thing for neural development, or neurological effects. A hundred children have been selected and they'll have neurological tests in Kuujuaq. I think with an immune system component and a neurological component we'll have the two major expected health effects. And, I think in two years we'll have most of the answers about effects of these contaminants on the health of children.

Over the past ten years, we've already made huge progress in the scientific work necessary for risk assessment. We now know the compounds we're dealing with and from where they come.

### **In your assessment, is it possible to say unequivocally that POPs are affecting the health of people in the Arctic?**

We have evidence that POPs are affecting the health, especially the immune systems, of children. This will be confirmed in results of our study, expected in two years. The design of this study is more powerful than the design we used 10 years ago, so we'll be able to answer your question. And, in two years it will be easy to answer your question for the neurobehavioural, but now it is very difficult to say that.

### **On balance of indications, what would you say?**

I would say that there is a suggestion that those effects are possible, and that we are now doing the maximum we can to demonstrate that. We can do nothing more. It's a huge cord study, lots of money, lots of energy, and the maximum we can do, considering there are not obvious health effects. They are subtle health effects, and to find them you need sophisticated techniques and sophisticated studies.

### **What gaps remain in the correlation of POPs exposure to human health effects?**

There's the one I already mentioned—the effects on the foetus—that we are addressing with our study. Apart from that there is the issue of endocrine disruption, and what that will mean in terms of sexual hormones for the young male, for example, and the issue of sexual fertility. The reason we decided not to go very deeply into this issue in the Arctic is because when you discuss that with communities, or individuals, it's not something that people think is important. They don't have reproductive problems, so it's not perceived as a big problem. They know that the demography's okay, and the fertility's okay. All nurses and mothers have heard that Inuit children have 10 times the infection rate of children in southern Canada, but if you decide to discuss the fertility rate, there is no obvious problem in the North. And that's an important point because I strongly believe that when you start a big study that requires involvement of the people, they will need to be convinced that it's a real problem for them.

That's why the problem of hormonal disruption is not a priority for us in the Arctic. I'm not saying it's not a priority in terms of the planet and the human population at large; I'm just saying that the Arctic is not the place to look at this question.

### **Over the course of the years, you've probably been keeping one eye on the international efforts to ban POPs. What would you like to see in the POPs treaty?**

As public health specialists we try to manage a situation locally, for example, by promoting arctic char during pregnancy. That's a way to manage locally by dietary advice, but we all know that the long-term solution is not there. We also know the solution will take decades, so we have the responsibility to act locally to see if we can do something.

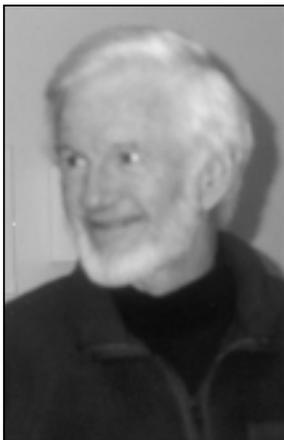
I was very happy to provide the native organizations and the federal government with data to fuel the debate, to speed the agreement a little bit. But because I also work in Mexico, I know also the other reality. We measure huge amounts of DDT in Chiapas peasants—100 times that in Inuit. So the people using the chemicals are also very highly exposed, and any research done in the Arctic is also very important for them. They have to realize it's not only for the "poor Inuit," but also for their own populations. We just finished a small study in Chiapas on male fertility that showed a very strong effect of DDT on male fertility parameters. But from our work in Chiapas we also realize that malaria is a huge problem, DDT is very important for epidemics, and there are no real alternatives at this time. Everybody must promote alternatives and invest in a strategy that's more ecologically acceptable and that, from a public health point of view, would also be better. But it takes a long time. I have seen some organophosphate sprayers who tell me half of them will be in the hospital in two days, because they have no clothes, no masks, nothing. I'm sorry to say, but from an

acute point of view DDT is a very low toxicity pesticide, safe to use for the local population, the day-to-day sprayers. When you balance everything, it's a little confusing; it's not so simple.

I get the feeling that the rich countries, with their small Inuit populations, say, "Look, we have some of our population suffering from your dirty pesticides and you have to stop them." But I'm still waiting for the rich countries to say, "We'll put in billions of dollars to help you find alternatives to the POPs you are using." And without this money, it's a little hypocritical. I realize from my small experience in Chiapas that the money needed to change all the usage of POPs will be huge. And it will take a long time. And it will take a long time if we want the cure to be better than the problem. If you start to use organophosphates everywhere in the world, you will have thousands of deaths by toxicity. If you want to use pyrethroids, it will cost a lot of money and it will take time to teach people to use them. The problem is in how far countries want to go in phasing out these chemicals. It's mainly a question of money. ■

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## Andrew R. Thompson 1925-2000



It is with sadness that we inform CARC's many supporters and friends of the passing earlier this year of Andy Thompson. Many of you will remember Andy as a founding member, long-time chairman, and the longest-serving member of the board of directors of the Canadian Arctic Resources Committee. His immense experience, his remarkably

imaginative and inventive mind, his sincerity and commitment, his insistence on getting the facts right and on listening to others, that delightful sense of humour, and his genuine friendship made working with him very special. Canada and its North are the better for Andy's efforts. His character and his conduct serve as standards to which we can all aspire.

In 1950 Andy began a career that was to span 41 years of teaching and conducting research in resource and environmental law at the University of Alberta and the University of British Columbia. He chaired the British Columbia Energy Commission and was Commissioner of the West Coast Oil Ports Inquiry. Organizations that he founded or was a member of include the Canadian Petroleum Law Foundation, the International Council on Environmental Law, the West Coast Environmental Law Association, the Sierra Legal Defense Fund, the Arctic International Wildlife Range Association, and, of course, the Canadian Arctic Resources Committee.

Andy cared deeply for his family and nurtured their respect for nature. He worked with passion for Canada's Aboriginal peoples, for the environment and resources that sustain us all, and for his many students, whose practice, teaching, and research continue his legacy. Those of us privileged to know and work with Andy Thompson are so much the richer in mind and spirit for that experience. ■

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ISSN: 0380-5522