

Gazette interview

Chemicals not proven safe

With the coming of spring, the issue of forest spraying will undoubtedly come our way and the forest companies and anti-spray groups will once again wage battle.

One of the biggest weapons the anti-spray groups will employ will concern the relationship between the increasing incidence of Reye's Syndrome, a potentially fatal children's disease, and certain chemical emulsifiers used in the budworm spray program.

The symptoms of Reye's Syndrome include a fatty build-up on internal organs and severe brain swelling. These symptoms have been linked to changes in cellular mitochondria, the energy producing sites of the cell, believed to be caused by some as yet unidentified factor present in the cells of affected patients.

Reye's Syndrome is related to the invasion of the cell by a virus, especially the influenza B and chicken pox viruses. The current theory is that the unknown factor somehow brings about a change in the cell, turning an otherwise common viral infection into the potentially fatal Reye's Syndrome.

Dr. John Crocker, a pediatrician with the Isaak Walton Killam Hospital for Children, has been researching the possible connection between Reye's Syndrome and the unknown factor, suspected to be a chemical or chemicals used in forest spray programs. Recently Maria Rey of the Gazette interviewed Dr. Crocker at the I.W.K. Hospital.

Gazette: "You have been quoted as saying that there seems to be a definite connection between the incidence of Reye's Syndrome and some chemical emulsifiers used in forest spray programs. What evidence do you have of this?"

Crocker: "We have animal data, in tests performed with both miniature pigs and mice, as well as invitro plaque culture techniques in which we actually take layers of cells with a media that contains a very small portion of the chemical that contains and expose it to certain viruses, and we reproduce a similar action to the invivo (in body) reaction. So there is an interaction between certain viruses and commercial pesticide emulsifiers.

Also, we've had quite a few communications from areas as diverse as Colorado, where their cases of Reye's Syndrome are suspected to be connected to their spray program.

Thailand has also reported that their cases of Reye's are connected with the way the people farm. In one area of the country where the children are taken out of school to help in the harvest, the chemicals are sprayed right in the fields. The other provinces don't do it this way, and Reye's Syndrome occurs only in the area where the children are exposed.

Thailand has recently come out and said that it can show that their increase in Reye's Syndrome has increased directly proportional to their national importation of pesticides. So there is a fair amount of data accumulation for chemical-viral interaction as a factor in the pathogenesis of Reye's Syndrome.



Dr. John Crocker has been researching the possible connection between Reye's syndrome and chemical sprays.

Gazette: It would appear that the unknown factor suspected of being the chemical emulsifier could easily be identified if it were isolated. Why has it not yet been identified?

Crocker: "One of the big problems in trying to do an isolation from human tissue is that many of the techniques are not well worked out. What you really want is to have the chemical isolated from the brains of children who have had Reye's Syndrome, and show it to be biologically active. That is where technical problems arise. We thought that we would be able to do this because we have been working directly with isolation of pesticide bi-products from children's brains from certain areas where they were sprayed, but when we got to the emulsifier, techniques are lacking. Even if we pre-inject the tissue, we can't isolate the chemical, this may be due to the active metabolism of the agent.

Gazette: "From what I know about Reye's Syndrome, a patient always gets an initial mild viral infection and then a few weeks later develops Reye's Syndrome. This mild viral infection is what has been linked to Reye's Syndrome. How do you account for the time lag between the two?"

Crocker: "When we first started research seven years ago, it was kind of untenable that there be a chemical, then there be a lag period when a virus infection occurs, and then suddenly Reye's Syndrome. However, the current work in carcinogenesis has shown that you can have two separate

chemicals, an inducer and promoter separated by a huge time lag such that the first chemical changes the metabolism of the cell somehow to make it susceptible to the cancer inducing substance.

What the emulsifier is doing is changing your cell metabolism. That then changes your reaction to a virus."

Gazette: "Two years ago, Fenitrothion and its emulsifiers were the chemicals under question in the spruce budworm controversy. Are they still today?"

Crocker: "The New Brunswick government I gather is thinking of gradually switching over to other chemicals.

I think that Fenitrothion was reasonably priced, said to have low mammalian toxicity, was readily available to them and was felt to be an effective agent against spruce budworm. I don't know whether all these factors are scientifically substantiated.

You're probably aware that Fenitrothion was a Czechoslovakian invention which the Japanese took because they don't recognize Czech copyrights. They made it into an even purer compound and sold it under the name of Sumathion. The Japanese have not done adequate biological testing in my opinion. The Czechs have made an effort to do quite a bit of human testing and their data does show that there are toxicity reactions with Fenitrothion.

One of the problems that we have with Fenitrothion in the environment is that we don't know what happens with its most toxic by-product, S-methyl fenitrothion, or its half life in the environment. All of the environ-

mental data was based on the pure compound and not its most toxic by-product.

There is some data by Yule, out of Ottawa showing that Fenitrothion lasts in the environment from year to year."

Gazette: "You have said that many of the forestry agencies will often say 'well, we've stopped using emulsifiers so your project is redundant'. Can you clarify this?"

Crocker: "That is one of the problems. The trouble is that if we backed off working out the toxicity of these compounds they would state that the toxicity was never observed and then start re-using them.

I think the government is getting out of all these problems by getting out of Fenitrothion. It is not licensed in the U.S. It is issued under special license in small areas of Maine. Maine, of course, is getting out of spraying by 1981. The Canadian federal government has not required the companies to do reputable studies. There have been a lot of studies, but they have not been done by labs that are set up to do good human and animal toxicity testing. Our government doesn't check much of this data for accuracy."

Gazette: "So when the government is approving a certain chemical for pesticide use, they don't test it in their own departments?"

Crocker: "The government's laboratories do very little toxicity testing in proportion to the amount of chemical spraying done in Canada. Private university research into toxicity has been poorly funded. Environmental health research is still a radical term in Canada. And even now, unless they send a review to the U.S., proper quality scientific evaluation of work is not readily available in this country. To get a review from a national Canadian research agency riddled with basic science errors, obviously they must be sending them to people in industry because many of the biological errors keep recurring in both the reviews of grant proposals and at discussions with industry."

Gazette: "So why is the government not putting that much research into something that they are going to be using? Why all the hassle?"

Crocker: "The federal government has done the licensing and monitoring of the chemical sprays. Their pesticide branches in agriculture and health gave the clearance for their use, and for someone to start questioning the toxicity of a chemical that they have licensed is sometimes taken as a personal insult. We haven't had trouble with the politicians, it is the bureaucrats we've had trouble with. It's become very obvious to me in meetings in Ottawa just who is insulted by our work. When you track it all back, you find that those insulted are the ones involved in the stamp of approval and you've obviously questioned their credibility.

If your job is to screen a group of chemicals, and you say that they are all O.K. and then someone comes along and questions this sometimes showing your scientific inadequacies, the natural reaction is to defend your errors. We didn't realize this at the beginning of our work. It wasn't our intention to insult anyone. We were working with the knowledge of the New Brunswick Department of Health, and the intention strictly was that if a relationship was found between the chemical sprays and Reye's Syndrome, they would advise their forest companies to change their formulas.