

Monsanto

FROM
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DATE February 26, 1981

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SUBJECT :

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F.Y.I., attached is the rough English translation of a Belgium TV program on Agent Orange/TCDD which aired on February 10.

You'll note that the text includes interviews with Selikoff, Allen and Meselson, among others.

DRB
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DRB:ec

Attachment

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CONQUER THE WORLD : A POISON (GIFT) OF CIVILISATION

In Dutch "poison", also means "gift".

The following is a very rough translation of this program that appeared on Flemish Television (BRT, 1st channel) on Tuesday, February 10, at 21.50 hrs. under the above title.

Contributors to the program were:

- Prof. A. Vercruysse, A.Z.-V.U.B. Brussels , toxicologist
- I. Selikoff, Mt. Sinai Hospital, New York , epidermologist
- I. Stainier, vice-president Fytofar
- Prof. A. Heyndrickx, R.U.G. Ghent, toxicologist
- A. Hay, Leeds University, biochemist
- J. Allen, Wisconsin University, pathologist
- M. Meselson, Harvard University, biochemist
- N. Rossi, Seveso, general practitioner

Introductory to the program in an explanation about poison, such as snakebites, antidote, arsenic and the chemical structure of poison.

Mankind's joy about the discovery of DDT, first man-made pesticide, seemingly a gift, until some 30 years later different after effects were discovered. It was no longer an excellent pesticide, it had become poison.

DDT is one of many man-made chemicals. In a span of 20 years the American industry alone, developed 14.000 pesticides. Pesticides, herbicides, fungicides and bactericides have all been developed in order to destroy a certain goal, but the question remains what do we know exactly about the abundance of chemical products ? Did science learn anything from the previously discovered poisons ?

This program will try to give an answer to these questions, by selecting one specific poison, used in a commonly used herbicide. Its chemical structure is surprisingly simple. It also is the most poisonous molecule, ever made by man: Dioxin .

When asking ourselves how poisonous a certain chemical is, in fact, we mean how many people can it kill ? As far as dioxin is concerned, scientists still have to do guesswork. It cannot be tried out on men, however, imagining a tablet of 0.5 grams (like an Aspirin), it is assumed to be able to kill 350 adults.

What is the true character of this poison ?

Dioxin in fact is the name of a large group of chemical structures. The poisonous molecule in question, is only one of them and is called in full 2,3,7,8 Tetrachlorodibenzodioxin or TCDD.

Prof. A. Vercruysse subsequently explains the structure of the dioxin molecule, indicating the most poisonous molecule TCDD, or the "dioxin " from the newspapers.

(The program shows some the effects dioxin can have on men, such as chloracne.)

Where does dioxin TCDD derive from ?

One explains the chemical procedure to make the herbicide 2,4,5 T, starting from benzene, tetrachlorbenzene, the heating process through to trichlorophenol, the basis for several end-products.

Dioxin is formed during the heating process.

I. Selikoff:

"Dioxin is a contaminate; nobody manufactures it. It is absorbed in commerce. And therefore we don't know much about what happens to people who are using it, such as we would with lead, or with mercury, asbestos, or with polychlorinated biophenols and other chemicals".

Dow Chemical, the largest producer of 2,4,5 T admits that herbicides could be freed from dioxin , although this is complicated and thus an expensive process.

I. Selikoff:

"This is a critical problem now for our society in general. Our industry, our life, our livelihoods are based upon the very valuable products of the chemical industry. At the same time we want that industry to continue without contaminating our will".

One of the ways dioxin can poison our world is through the residue of the chemical after spraying for instance with 2,4,5 T. The American forestry industry is one of the largest users of this chemical, and according to the industry, it is necessary to grow large healthy trees.

Due to the large surfaces of American forests, spraying is mostly done by aeroplanes.

Thus for 30 years it rained 2,4,5 T, not only on the American trees, but also fields and roads were freed of weeds etc.

3.000 to 4.000 T 2,4,5 T/year were used in American forestry.

Total use in England in 1980 amounted to 50 times less and in Belgium to 20 to 30 T.

In Belgium and England about one third of this was used to keep the railway lines weed-free.

Forestry took another third.

2,4,5 T is manufactured in several European countries but most of the raw material comes from W. Germany. In several European countries 2,4,5 T is now banned, however, not yet in Belgium.

Although the British Advisory Committee on Pesticides still feels that the chemical may be used, it will be used less in future in England due to the Trades Unions advising their members against it and the TUC demanding a complete ban.

In Belgium this is not yet the case and they are awaiting a scientific report from the EEC, expected this spring, on 2,4,5 T.

Herbicides based on 2,4,5 T are also available to home gardeners. Some 10 of them contain 2,4,5 T. Only few manufacturers warn of the use and the effects it may have on animals, fish and children.

(A range of products is shown, among which it is difficult to detect Monsanto's products).

In 1980 the degree of dioxine was fixed not to exceed 1/100 milligram/kg product.

I. Stalnier:

"For about 12 months now, European manufacturers have been able to make the product almost completely dioxin-free, remaining 0.01 part of a million. Thereafter it is diluted and the user will do so again in 3 to 400 liters/hectar".

In those countries where 2,4,5 T is permitted, governments consider the product safe, although it still contains a minimal quantity of dioxin . The question remains, however, whether governments have the means to execute a proper control on the manufacturers. The permitted quantity of 1/100 part/million was agreed upon with the World Health Organization, assuming that such quantity would do no harm to human beings.

However, government laboratories doing some random tests, are not always prepared to publish the results. Mostly, they say, no dioxin is found.

The most precise measurement is usually done with a mass spectromometer and the British Advisory Committee admits that the permitted quantity of dioxin concurs with the lowest amount that can be measured with the mass-spectromometer.

Dioxin therefore appears to be unmeasurable. Most random tests give the same picture: a high peak (on the screen), but no trace of dioxin .

In view of these problems, as well as public fear, it would be wise to find substitutes for 2,4,5 T.

Prof. A. Heyndrickx:

"He does not think it necessary to completely ban the product from the fields, used in such minimal concentrations, permitted to-day. However, the problem remains of the manufacture, transport and putting into use of the herbicide in agriculture. Hence the advice to substitute them by others. From the agricultural point of view there are no problems. Financially and economically, of course, there are, but health should not come into this. I do not see the reason why we should not do so".

How is it, that dioxin in these minimal quantities can have such killing power ? How does the poisoning take place ?

(Subsequent explanation/pictures, of how and what poison, like snakebites, and arsenic does to the body).

Dioxin however, is active through skin contacts, as well as through inhaling. What it does inside the body is largely still unknown, and quite a problem for the toxicologist.

There are two possibilities:

either wait until people accidentally get contaminated or immediately experiment with animals.

In the early 40s dioxin was manufactured without anybody realising it. Only 13 years later it was identified by Dr. Schulz, during an inquiry into an accident in a manufacturing plant of trichlorophenol. He had already encountered chloracne, the skin disease, especially among workers of the manufacturing plant, however, nobody knew for sure the origin of the illness.

Schulz bought some trichlorophenol and smeared it on a rabbit's ear, which resulted in chloracne within a few days. Thereafter he did the same, but this time with chemically purified trichlorophenol and nothing happened.

From this he concluded that the illness derived from an impurity in the product and not the product in itself.

Dioxin was the most obvious. He even tried it on himself.

For the first time some of dioxin's gruesome secret was disclosed.

Chloracne, was only the first symptom of this deadly poison. but how does one define how deadly a certain quantity of poison is? What is the lethal effect?

With animals, one can define the grade of toxicity by giving them increasing doses of poison and see their reactions.

Prof. A. Vercruysse:

"If experiments go well they result into a certain curve, determining the lethal effect for certain kinds of animals (for instance LD_{50}), being the characteristic for a certain animal species, a certain quantity of poison and a certain type of poison".

It is assumed that there is a certain connection between the weight of the animal and the lethal dose.

A. Hay:

"Dioxin is unusual, first because of its extreme toxicity. It is very toxic at low doses. Secondly, there is a great variation between animal species and time taken to bring about death. For example, they vary between 6 and 43 days with different animals. Thirdly, there is considerable difference in the toxicity of dioxin in animals".

50% of the rats die after a quantity of 0.022 milligram/kg body weight. Mice are smaller, but far more resistant. For them 1.100 milligram is the lethal dose. The relatively heavier guinea pig, however, is most vulnerable with 0.0006 milligram being deadly.

Thus, the toxicity of dioxin has quite different effects with different animal species, however, it is still not clear how these animals come to their end.

A. Hay:

"I should say that we don't know what causes death in dioxin-poisoned animals. What we do see, however, in animals that are poisoned by the chemical, is that there is a general wastage followed ultimately by death".

Thus, dioxin has been identified. It causes chloracne and is capable of killing animals.

A biologist of the National Health Institute of North Carolina detected the following: In order to find out whether dioxin could be teratogenic, a herbicide was prepared with a high amount of dioxin and subsequently given to pregnant animals, like rats and mice.

Mice received a daily dose of 100 microliters = 1/10.000 of a liter for 8 days.

Firstly the bone structure was minutely examined and the skeleton dyed, so as to detect malformations more easily.

Diane Courtney, who lead the inquiry, did not find anything abnormal in the skeletons, however, when examining the fetis, they found an alarming amount of malformation. One of three had a split palate. They had swollen livers and internal bleeding. The evidence against TCDD increased. It was highly poisonous, caused chloracne and misformed fetis.

The University of Wisconsin tried to prove that dioxin could cause cancer by feeding rats with minimal doses of dioxin . For two years, the rats were observed, have a diet of at the most 1/millionth of a gram dioxin per gram of food. Signs of poisoning became apparent after two weeks and after 4 weeks the rats that had received the highest dose, died.

Towards the end, less than one third of the rats only, were still alive.

(The program shows microscopic pictures of the lung, and livers of the diseased animals, showing tumors and growths, in other words, cancer).

Almost 50 of the experimental rats had developed cancerous cells.

Strangely enough soon afterwards their findings were confirmed by researchers from the chemical industry.

J. Allen:

"Dioxin is a known carcinogenic agent in experimental animals. It is a known promotor of cancers in experimental animals. There are insufficient data to date to know one way or the other if it is a carcinogenic agent in man".

In order to put an end to the speculations about this missing link in scientific knowledge, J. Allen decided to experiment with apes, the mammals which most resemble man. He also mixed certain doses of dioxin with the female ape's food, measured in one millionth of a gram. Later on, they received doses 10 to 20 times less toxic.

The first point that became obvious was that these females had difficulties in getting pregnant. Subsequently 3 of the 8 pregnant apes had miscarriages.

Allen discovered that the first poison symptoms of the apes receiving the food mixed with dioxin , took place after receiving a daily dose of 1.000 millionth of the body weight.

J. Allen:

"She is very thin now. She aborted approx. 3 weeks ago or so. She was between 35 and 45 days gestation and during the implantation period, she began to haemorrhage very severely and lost the pregnancy".

The miscarriages were a bad sign but later discoveries were much worse: serious shortage of bone marrow, combined with bleedings. Large haemorrhage in the heart. Gangrene in finger and toe nails and all outward signs of general inward decline.

J. Allen:

"After the animals had been on a diet for approx. 33 months again we were forced to remove them from their experimental diets due to their debilitated state. They began to show a decrease in circulating blood components, they began to lose all of their hair, had swollen eyelids, a loss of eye lashes, subcutaneous oedema and what we considered impending death".

However, do these gruesome effects also apply to men ? On this level the effect of dioxin on men should be the same as on animals. Thus one could affect the nucleus at the moment that the cells multiply, when DNA it itself is in danger.

Prof. A. Vercruysse:

"A number of symptoms of the effects of dioxine on men are known. Chloracne, the influence on certain organs, fear of teratogenic effects; but a certain teratogenic effect depends upon the influence that the product can have on the fetus of

Of course all these effects are still incomplete and their reality cannot yet be explained ".

From the many different theories to this effect the most recent and intriguing one was shown on BBC television in the program "Horizon".

During the multiplication of cells DNA is being spliced and the double strand opens up to reclose again afterwards. In order to examine a chemical on DNA, one has to add a special instrument to the DNA, after which it is heated. The heat opens the DNA like a zip and shows the effect of the chemical in visual form. When cooling down, the DNA closes, containing, or not containing, the genetic information in the correct form.

When examining dioxin on the DNA everything appeared normal. The heating, the opening, the cooling, but then the DNA did not close by itself. The normal recovery failed, to everybody's surprise.

Thus, this experiment would localise the poisonous effect of dioxin. Every time the DNA opens up, dioxin will prevent it from closing. This would also explain why dioxin is so poisonous where cells are most active: in the fetus, the liver and the making of bloodcells.

It appears that the malignant mechanism of dioxin has finally been found.

It was because of Vietnam that the public developed an interest in dioxin., certainly in the US. Thick bushes confused bombing pilots and lead infantry into ambush. It was decided to systematically de-leaf all trees and the American generals had just the product. Agent Orange.

A mixture of 1/2 and 1/2 of 2,4,5 T and an other herbicide.

Regretfully Agent Orange was heavily polluted with dioxin. Over a period of 7 years, approx. 50 million liters of Agent Orange were sprayed. But having the successful effect of

de-leaving trees, what was the effect on men, accidentally sprayed as well ?

The Harvard geneticist M. Meselson went to Vietnam and found proof.

"Some of the most important discoveries in toxicology and in medicine have begun with anecdotal information. There is a mass of anecdotal information. It includes allegations of birth defects to the children of exposed mothers and birth defects also caused in the offspring of the exposed fathers, which is a rather unconventional concept".

After Meselson's discoveries the spraying was stopped out of concern for the local population. But what about the American soldiers, who often operated in the sprayed areas ? Something was cooking. And it did explode when they came home.

Ton Hutts has chloracne and tumors. His children have all sorts of abnormalities. He thinks it is all caused by Agent Orange. This also goes for the children of John Watts, who has himself chloracne and liver damage. Cause: Agent Orange.

Steve Zarbis has multiple sclerosis, and his illness worsens much faster than doctors had expected.

Zarbis is certain that he was poisoned by Agent Orange.

400 other Vietnamese veterans have similar complaints and after slow examination, doctors indeed found traces of dioxin in their bodies.

Dr. Meselson:

"If there is clear-cut association between dioxin and the body and your health, then, together with what we know from the animal experiments showing how toxic dioxin is, you would have as good a proof as normally can ever be obtained in the field of environmental toxicology, showing that dioxin was responsible for the ill health of the veterans".

Since complaints increased, Meselson focussed his attention on the dangers of herbicides in time of peace. For years 2,4,5 T was sprayed on fields and prairies. He wanted to know whether beef was contaminated with dioxin and could thus enter into the human diet. He examined meat in the cattle area from Missouri through to Texas, and found dioxin in most samples.

Meselson wanted to know for sure if men had ingested the dioxin and he did so by examining mothers' milk.

He says:

"We took the milk from approx. 40 women and we analysed this. And we found peaks in the mass-spectrometer which we confirmed at least in the sense of doing multiple analyses of that sample. We found positives in a number of women, particularly from regions where 2,4,5 T is used to spray range land where cattle graze".

The danger of dioxin in our diet is that of regular intake in unmeasurable minimal quantities over a long period and therefore its danger, even to our offspring.

Prof. A. Heyndrickx:

"Our measuring methods are limited, although already going as far as a part of a trillion. But there is nobody to say that when examining human blood or urine and one cannot trace anything due to the inadequacies of the chemical apparatus, these possible small quantities cannot be extremely dangerous, in the long run and that is the crux of the matter to date, not only for TCDD, the dioxin, but also other chemicals. The chemical industry likes to hide behind it. Why? It is a matter of responsibility".

Thus, scientists stand alone in their investigations into the toxicological effects of dioxin on mankind. The best method is of course to examine those people who have been exposed and most obvious would be the workers in the chemical industry.

It is striking that almost every plant manufacturing trichlorophenol, the raw material for 2,4,5 T has experienced at some time an accident; seldom, however, brought into the open.

A. Hay:

"We do know that there have been over 16 accidents in different trichlorophenol plants since 1949. Over a 1.000 people exposed to the chemical and I believe we have to look at these people to try and find out what the effect on human health is".

Hay made a study of the accidents with dioxin and of the 16 he found 3 of special interest.

At first the most recent one: Saturday July 10, 1976; the Italian town Seveso. The local chemical factory makes trichlorophenol.

An explosion, a yellow cloud. Two weeks later the Swiss company Hoffmann La Roche warned about it containing dioxin. The grounds were fenced in. Animals died. The surroundings were evacuated. Pregnant women asked for abortions. There are more than 600 cases of chloracne. The inhabitants of Seveso are back now and the most serious wounds seem to have healed. But the factory is still there, empty.

It was the first accident where a whole population was exposed to dioxin ; a unique chance in fact, to prove what the poison could do to men. However, the chance was lost in Seveso.

Statistics and evidence remain buried under the bureaucratic and political mill. However, truth can be heard from the Seveso doctors. Their findings are gruesome.

Dr. Rossi:

"I think chloracne is not the only proof that dioxin is poisonous, since we do not have new cases of chloracne. However, we do have swollen livers, neuropathy and miscarriages."

Seveso remains a split city. The contaminated areas have been fenced in. Seveso still waits in fear. Would anyone ever want to live there again ? The government says that since the chloracne has disappeared, then the dioxin did as well, and no-one need be concerned any longer. But why are the streets still fenced in ? Why the warning signs ?

Well, some think it could have been much worse. The streets were full of dead animals, not men. Nobody died of dioxin

Dr. Rossi:

"I have established, in what we call the deadly quarter, an increasing amount of cancer amongst youths and that the total amount of death is no longer in accordance with the average for the rest of the population. I cannot prove the cause of death, but I can simply conclude a higher mortality rate ".

An important chance was missed in Seveso. Nobody knows how much dioxin came upon Seveso. May be the area is still contaminated . It is doubtful that inhabitants will see the end of their trouble.

Prof. A. Heyndrickx:

"What does Hoffmann la Roche say about the accident in Seveso ? In fact it was no accident. It was pure carelessness, for which the Swiss firm is completely responsible. But, they say, traces are no longer found in blood and urine, and thus no more toxicity, and for them the case is closed.

But, together with our Italian colleagues of the University of Pavia and Nuclear Centre of the EEC in Ispra, who will pave the way, or break new grounds, we agree that that is no conclusion and that we should put a questionmark as to the future within the coming years. Therefore, scientifically speaking, it is irresponsible to say the case has been closed.

8 years before Seveso a dioxin. accident took place in England: April 23, 1968, Bolsover in Derbyshire.

The Coalite Company was a newcomer to the chemical industry. The company was reknown fbr its smokeless fuel for open fires. The chemical department was set up next to a coal industry in the beginning of the sixties, when the world screamed for herbicides.

Coalite made trichlorophenol for 3 years when an overheated reactor exploded. At first, the consequences of the accident were noted with care. The company doctor reported 79 cases of chloracne amongst the workers. Checks on hygiene and safety clothes became more severe. However, the factory remained contaminated.

3 years after the accident two workers developed a malignant form of chloracne and also contaminated their families. Subsequently the company drew up a plan to monitor the health of their employees closely.

A. Hay:

"The follow-up survey was intended to include everyone who was exposed to dioxin . Coalite did tell the International Agency for Research and Cancer, for example, that they would try and follow up every worker who developed chloracne at this plant. I know for a fact that they did not follow up every single individual. They looked at a number of people, most of them were employed at the plant and they studied them for a variety of factors. They looked at liver functions, and they looked at blood lipids. The results of that finding suggested that there was some abnormality in liver function tests and that certainly some of the men were at a higher risk, developing a skincart disease."

The accident occurred almost 13 years ago, however, the complete report of the thorough examination, as promised, was still not publicised. Scientists await it eagerly, especially in the States.

It was in America that the first accident with dioxin was publicised: March 8, 1979, Nitro in West Virginia.

note
In this town, full of the chemical industry, Monsanto is the largest employer. At the end of the forties, Monsanto had started the production of trichlorophenol, when an overheated barrel exploded and employees were covered under a cloud of dust. At that moment dioxin was still unheard of and some 100 workers were put to cleaning up the mess.

Only 30 years later a complete medical examination was organised. More than 200 Monsanto employees, many of them retired, were traced. It is likely that this is the most significant examination ever undertaken so far. Many illnesses caused by the chemical contamination, cancer included, sometimes remain hidden for years.

(Subsequently the film shows Monsanto employees during their medical examinations).

These people were contaminated with dioxin 30 years ago. If dioxin could cause illnesses on the long term, then those are the people who ought to be examined.

Respiration, blood, urine, nervous system. Everything was carefully examined.

Monsanto workman:

"I have had pains practically ever since I left Monsanto. My legs, my back and my arms. Right now, my hands, they are just stiff, sore, my joints are sore and they have been that way ever since I had that poison. I asked to be transferred out of there because I was pretty bad and it just seemed like I had black heads all over me.

I even had them in my hair, eyebrows and hands, arms, legs. The only place I did not have them was at the bottom of my feet".

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mortality studies.*

This very thorough dioxin examination took place under the supervision of Dr. Irvin Selikoff. The more subtle symptoms of dioxin poisoning were also searched for.

More than 235 workmen were examined and the findings put down in files. A red dot means "exposed to dioxin". Those papers should reveal a lack of resistance to infections, or malfunctions in the blood cells and blood enzymes of, for instance, liver malfunction, one of the less obvious symptoms of a dioxin poisoning.

Earlier studies already showed that dioxin caused damage to liver and kidneys and could cause heart and nervous illnesses, even cancer. However, it is more difficult to define in men than with animals, since so many other factors come into the picture. Toxicity is complex !

Prof. A. Vercruysse:

"Toxicity depends on the possibility of resorption in the organism of animals or men, the possibility of decline due to the resorption, the exact route it follows in the body and the way the molecules are distributed etc.

An important factor also is the metabolism, the transformation of the molecules, often giving rise to a high toxicity rate. All these factors add up and determine the toxicity".

I. Selikoff:

"We have our fingers crossed that the cancers which can occur in animals will not occur in men. We have our fingers crossed, that the side effects in animals will not be seen with men. In general, we don't consider that crossed fingers are a suitable defence or a suitable way for people to protect themselves. We are very uncomfortable when veterans and others asked these questions and they are entitled to.

Is my wife going to have a normal pregnancy ? Is it save for me to continue to use these chemicals or herbicides ? It is uncomfortable for us not to know the answers at this time".

After man made dioxin , 50 years went by before the product became known, only a little bit. However, it had to take a war, 16 accidents, 2000 cases of chloracne and many dead and crippled animals in order to discover this knowledge about a "poison" of civilisation, nobody ever asked for. Meanwhile garbage is left to rot around Seveso; an enormous health risk, nobody seems to care about.

The dioxin story shows how financial interest can corner the scientific interest.

It is possible to make 2,4,5 T, completely dioxin -free. However, according to the business world, investment in such purification would mean commercial suicide.

And do we know how many other dioxin -similar chemicals exist ? And do they come free only during the chemical process ?

Recently, it became known that during the burning of chemical waste, TCDD came free and the world produces a lot of chemical waste !

Prof. A. Vercruysse:

"We have thousands of tons of chemical waste, very dangerous, and one cannot just simply burn this waste. They know very well in Amsterdam ! I spoke with colleagues and they found TCDD in their chimneys and subsequently stopped doing so. Thus, changing the chemical waste is one of today's most difficult problems. It is of no use to install burning ovens for normal garbage. It is too expensive and who is going to pay for it. For Brussels only, we pay F 700/T/day = F 700.000/day. Only in order to burn normal garbage.

I am not afraid of dumping this garbage in suitable places. I am far more afraid of chemical waste and we do not always have the technology, at the moment, to find a solution. Therefore, save your money in order to find a solution for chemical waste and other industrial waste. I should add that this whole group of chemicals such as TCDD, dioxin etc., to me, is far more dangerous to health than nuclear waste.

Why ? We can control nuclear waste, we know what happens. And nuclear industry is heavily controlled, which is not the case for the chemical industry. Therefore, potentially, the present danger is much larger and we should give all our attention to solving this problem with all our new chemical technology on hand, technology that has become so complicated and dangerous."