NEWSBAG // PG 62

THE WHOLE HOG // PG 63

EAMON CARR // PG 64

McCANN // PG 66

THE FLUORIDE DEBATE

FEAR AND LOATHING IN ASKEATON

It is one of the most shocking examples of pollution in Irish history. And it impacted in the most appalling way on the lives of local farmers, with animals dying and a litany of human health problems erupting. As a result, Nuala and Pat Geoghegan have been engaged in a running battle with the Irish state. But no one in authority seems to give a damn... REPORT ***Adrienne Murphy*** PHOTOS ***Iulian Gutu***

The Geoghegan family

In the last issue of *Hot Press*, we brought to light evidence that there were serious flaws in an official Environmental Protection Agency report, published in 2001, into severe ill-health and high levels of mortality amongst humans and animals in the farmland around Askeaton, Co Limerick during the 1990s.

The EPA investigation – which began in 1997 and took four years to complete, costing the tax payer IR£5.3 million – concluded that there was no evidence linking the extreme health problems of the area to industrial pollution. As we demonstrated in the last issue of *Hot Press*, scientific evidence at the time did in fact show that the land was contaminated with industrial pollution, and that animals were being poisoned by airborne fluoride. These facts were omitted from the final EPA report of 2001.

The farmland area of Askeaton, including 27 farms which co-operated in the EPA investigation, is adjacent to Europe's largest aluminium processing plant, Aughinish Alumina Ltd. Fluoride is one of the many toxic chemicals produced by this plant. It is also close to two electricity-generating stations at Moneypoint and Tarbert, which also produce high levels of pollution.

Aughinish began operations in 1983. In 1998, while the EPA investigation into the health problems of the area was taking place, the aluminium processing plant was granted an Integrated Pollution Control licence by the EPA.

This fact alone should raise serious questions about the reliability of the 2001 investigation published by the EPA. It seems extremely unlikely that the EPA would ever find against a business they had just licensed to pollute, no matter what evidence came to light.

Over the past week, Hot Press has unearthed further scientific evidence directly contradicting the EPA's conclusions, which were: first that there was no evidence for potential sources of industrial pollution in the Askeaton area; and secondly that there was no evidence suggesting that human health might be at risk in the area.

In 2011, a European Environment Agency report entitled *Revealing The Costs of Air Pollution from Industrial Facilities in Europe*, identified the 662 industrial plants in Europe measured as causing most harm to health and the environment through air pollution. Amongst these are seven

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(l to r) The Aughinish Alumina plant spews pollution; red dust on a plant and the killing fields

in Ireland, including Aughinish Alumina.

Since *Hot Press* published the scientific evidence highlighting the inadequacies of the EPA report, public and political pressure has been mounting, both in Limerick and nationally, for a new enquiry into the Irish government's botched investigation at Askeaton.

Locals are understandably deeply concerned that the Askeaton EPA report was a massive State cover-up of industrial poisoning in the Askeaton area, resulting in ongoing severe health problems for the people and farm animals still living there. Scandalously, there is strong evidence to indicate that hundreds of people in the Askeaton area – whose health and livelihoods are still impacted by severe, toxic airborne pollution – have been hung out to dry, so that big business can go on polluting.

There are many suspicious aspects to what is a deeply disturbing story about pollution in the Askeaton area. One of the most sinister is the 'loss', apparently by the Mid-Western Health Board, of over 20 human blood, urine, hair and nasal swab samples submitted for testing over a two-year period from 1997-8 by the Geoghegan family.

I travelled to Limerick to meet Nuala and Pat Geoghegan, and to take a first hand look at the Aughinish Alumina plant. They and their daughters, Amanda and Meghan (now aged 21 and 12 respectively), lived on one of the Askeaton farms that was most severely afflicted with animal and human health problems. Over a sustained period, the family experienced severe symptoms, including extreme joint, abdominal and head pains, chronic fatigue, vomiting, and serious respiratory difficulties. Nuala Geoghegan also suffered three miscarriages. Throughout this period, animals on the farm also suffered severe ill health.

The Geoghegan's samples from the late 90s – taken at times of obvious pollution fall-out on their farm – could have provided critical evidence for just what was making the people and animals of Askeaton so ill.

In a damning indictment of the authorities, the Geoghegan family have never been able to find out what really happened to these samples, which were given to the Mid-Western Health Board (MWHB). Some doctors stated that they were informed by the MWHB that at least some of the samples had in fact been tested and results delivered. Despite this, an 'internal inquiry' into the missing samples, carried out in 2000, found that a combination of "human and system error" was at fault for the loss of the samples, conveniently dismissing the possibility that they might have been deliberately 'disappeared'.

In 2002, Eamonn Gilmore, who was Labour's spokesperson on the environment at the time, called on the then Minister for Health, Micheál Martin, to launch an inquiry into how the pathology samples went missing. His call was supported by all of the opposition parties at the time, including Fine Gael and Sinn Fein.

The family had two meetings with Micheál Martin, but he refused to grant them a public inquiry to find out what happened to their samples.

What the health board may not have been aware of was that the Geoghegan family – disillusioned by the consistent failure of one State department after another to help defend them from the effects of industrial pollution – had begun taking and testing their own samples during incidences of pollution fall-out on their farm.

Pat Geoghegan speaks now with the confidence of having documented evidence to support his position. He believes that his family's samples were 'lost' because they revealed high levels of industrial poisoning.

The Geoghegan family have provided comprehensive documentation to *Hot Press* to substantiate every claim that they make in this article.

"In all the years that we've been trying to seek justice, no one has ever accused us of being wrong," says Pat. "Anything we've ever said, we can stand behind.

"The only reason we're saying there's a problem here is because we have gone out and done the testing ourselves. We even have post-mortems on our animals, which confirm the effects of industrial pollution."

Nuala and Pat Geoghegan finally had to leave their farm in 2009, to escape any further risk to their health. But they will not give up the battle to have the truth revealed – no matter how dirty it is.

"Whatever breath is in our body, toxic or not, we're not going to give up until we uncover what happened to ourselves and to the people of Askeaton," says Pat, who is 51 years of age now. "We will never give up, because we'll fight for our children, and what those responsible did to them. And we'll fight for what we know is going to happen to other communities – we want this pollution stopped."

If you didn't know how toxic the Askeaton area is, you'd think you'd landed in the pristine heart of exquisite native farmland. The Geoghegans' farmhouse is way off the main road, up a long winding boreen. It is overgrown, now that the family are no longer living on site.

Nuala inherited the beautiful, traditional 200-year-old single-storey farmhouse and yard, nestled amongst native trees, from her father. It is surrounded by 29 acres of lush, gently hilly fields, bordered by stone walls and hedgerows. She had grown up on the farm, working with dairy cows since she was a young child. When she married Pat, an idyllic future lay ahead in this secluded location for the family they planned.

The Geoghegans had a herd of up to 40 healthy, high-producing dairy cows, plus another 30 beef animals.

"But in 1989," recalls Pat, standing in the yard of their abandoned farm, "the animals wouldn't go in calf for us. Infertility was huge. We were wondering was it our own fault, but then other farmers started to talk, and there was a meeting in Askeaton, and all the farmers were having the same problems."

The EPA report stated that they could find no commonality between the health problems being experienced by the animals. Pat Geoghan dismisses this.

"The same problems were all there," Pat insists. "Infertility, the calves being born small, calves only living for an hour or two after being born. The cows coughing. Skin burns. Ulcers. Of course there was commonality."

And Pat is in no doubt as to the source of the problems that afflicted the animals. While there is a constant level of pollution, it is the toxic events, which seem to do the worst damage.

"When the pollution comes, it comes dry, but the fog wets it," Pat explains. "The animals inhale it and its sticks to their system, down their throat and into their lungs, and it burns them. If you have a heavy dew that isn't lifting, it holds the pollution there at the animals' levels, and they inhale it."

The effects he describes are gruesome.

"We've had cattle that'd be due to calve and you'd put in your hand and pull out pieces of the calf out of the womb. They'd be gone off. You'd smell them. They would've died inside the cow. We've seen ulcers the size of a plate on the hides of the cattle. Their backs have been scorched. When they inhale pollution, to try and get it out, they'll have white stuff streaming from their nostrils. Wherever they'd be standing, the ground would be all wet from it.

'When they'd be trying to eat their nuts, they'd be so soggy from this stuff they wouldn't want to eat. We've let cows out into the nicest of grass, and they'd sniff the grass and they wouldn't touch it. We've had cows that if they lay down in the grass, you couldn't milk them, because their udders would be all raw, they'd be so burned by the caustic stuff in the grass. That's how bad it is.

"There was huge mortality of cows in this area. A cow couldn't keep going, because her immune system was being taken down, because she was coughing the whole time. If you're coughing the whole time, and you're trying to produce milk for a calf, and produce milk for human consumption, it's just impossible. We had a field up the road and when we'd bring the cows down, we used to have to wait an hour to get them standing, because the pollution would catch them there."

Pat and Nuala began calling this high area of their farm 'the killing fields'.

"One day we went up and two animals were dead. Because what it does is, it sends a signal

into a cow that she's bulling – looking to be serviced by a bull – even though she might be in calf. It'd affect their hormones. So she'd rise on animals looking to be bulled. And she went around and kept on rising on the animals, and she broke one of their backs, and she killed another cow and broke her neck. She was so driven mad by the stuff. It drove animals absolutely mad."

The financial impact on the family was devastating.

"This was our livelihood," says Pat. "We had nothing else. But the calves were stunted. Our cattle could be six-years-old by the time they would be the level of a three-year-old on an unpolluted farm. You'd have to put in everything to try to make the calf grow. Vitamins, injections, extra nuts, extra feed, to try to keep bringing them on. They'd linger on maybe for months and months before they'd die. You'd be paying for vets to come in the whole time. It absolutely broke us."

According to Pat, the pollution comes in two forms: as both visible and invisible emissions from the chimneys at Aughinish; and as red dust, which blows off the 250 acres of open 'red mud' waste lagoons beside the Aughinish plant. Looking down from the vantage point of the farm, I can see the chimneys, five miles away, on the banks of the Shannon, spewing out smoke.

According to scientist Declan Waugh, the waste lagoons at Aughinish are not just the biggest single source of fluoride pollution in Ireland, but also one of the most fluoride-contaminated sites in the world.

Walking up 'the killing fields', I notice red dust in the grass. Pat confirms that it is the red dust from the Aughinish waste lagoons.

"We asked the EPA to come out and check the red dust we had on our farm against Aughinish. They refused to do this. We have that on record, in a letter."

Why did they refuse? I ask.

"Because they're the EPA and they're untouchable," Pat says, informing me that under its founding legislation, in an astonishing piece of State chicanery, the Irish EPA has official immunity from prosecution.

"They're accountable to nobody," Pat says. "They can't be sued."

As we walk the fields he once farmed with such pride, Pat recalls in more detail what drove him away.

"The red dust forced us to make a decision," he says. "It was on the grass, it was in the troughs. The cows were eating and drinking it. Our wellingtons would be red after walking through a field of high grass. It would blow into the house. Because of it, we stopped producing milk. We felt had to: we couldn't produce a safe product. That was our main income – and it was gone."

Walking down from the field, I notice a catch in my throat. Pat coughs and looks uncomfortable. He becomes breathless and visibly weakens.

"Is that it, now?" I ask.

"Yes," he replies. "Yes, it is."

Pat also describes how the emissions from the Aughinish chimneys infiltrated his land. He speaks from the instinctive perspective of a farming man, whose business is to observe the minute operations of nature, of weather and of wind.

"Sometimes we'd see clouds," he says. "Other times we wouldn't see anything. But we'd know it's here because we'd smell chemicals, or we'd

THE FLUORIDE DECEPTION

The role of fluoride in the poisoning of humans and animals in Askeaton is beginning to emerge. WORDS ***Adrienne Murphy***

Animals are among the many victims

Mounting scientific evidence shows that what occurred in Askeaton in Co Limerick from the late '80s to the late '90s amounts to one of the most extreme incidences of industrial fluoride pollution in the world, with background soil concentration on farms up to five times the global average. As revealed in the last issue of Hot Press, the official report from the Environmental Protection Agency effectively shut down further public investigation in the area. However, Hot Press has uncovered inconsistencies and contradictions in that report, sufficient to require an official public inquiry.

Further fuel has been added to the call for an inquiry with the revelation that as far back as 2002, Canadian environmental expert Professor Rory Finegan also flatly disputed the findings of the EPA report. "The views expressed by the authors of the EPA report are in conflict with each other and are inconsistent with the data produced by the investigations and are therefore flawed," Professor Finegan told the *Irish Independent* in 2002. In 1994/95, Professor Finegan had prepared three reports on the Somers farm, which is located in the Askeaton area – but these were entirely ignored by the EPA report.

The Canadian scientist pointed out that farmers experiencing problems in the area received emissions from several sources and from two major directions, Westerly and Northerly. The Professor stated that emissions from even one factory in the area could exceed the level that caused damage to crops, and illness in animals and humans. However, he pointed out that these 'pollution events' were transitory and, having exerted their toxic effects, were replaced by less malign levels. He said the EPA report had ignored this aspect of the behaviour of industrial emissions and had instead considered averages and mean levels over periods of time that "conceal the true state of the atmosphere in the vicinity of the farms."

This preference is consistent with a calculated attempt to provide a clean bill of health to the industrial plants in the area, irrespective of the evidence. Dr Finegan also pointed out that – diametrically contrary to the EPA statement that suspicions of aluminium and fluoride pollution were not based on any record of contamination – he had personally provided results to the EPA from a specimen taken from an unused water trough, clearly showing significant levels of fluoride fallout on the Somers farm. In effect, this amounted to an accusation that the authors of the EPA report had distorted their findings.

In the preparation of the EPA report, the Dept of Health was given responsibility for investigating claims that human health was being severely affected. Askeaton residents claimed that from the late 1980s onwards, unusually high levels of both human and animal health problems – some very severe and leading to mortalities – were due to pollution from the three large fluoride-emitting industrial plants in the locale. Shockingly, as revealed by Nuala and Pat Geoghegan in this issue of *Hot Press*, samples they had provided were apparently 'lost' by the Mid Western Health Board.

Conveniently, the EPA report dismissed the claims made by the Askeaton farmers. However documents released under Freedom of Information showed that doctors within the MWHB had stated that at least some of the samples had been tested and the results returned. These results were not included in the EPA-led investigation. What happened to them has never come to light.

Meanwhile, Hot Press has learned that in 2001, the Consumer Association of Ireland also condemned the EPA environmental investigation at Askeaton, saying that its conclusions were flawed. The CAI's analysis of the EPA report said in very clear terms that industrial pollution was causing human and animal health problems in Askeaton.

In the light of this accumulating evidence, it appears increasingly likely that disastrous industrial fluoride poisoning at Askeaton was deliberately covered up by agencies of the Irish government, at the same time as the decision was taken in 2002, by the Forum on Fluoride, to continue fluoridating the population by dumping hydrofluorosilicic acid into the pubic water supplies.

In his groundbreaking book, *The Fluoride*

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find our faces being burned, or we'd find it in our chests that we can't breathe. It's a silent thing. It comes, hits you and is gone."

He describes how the invisible emissions – the 'fall-out' – snake uphill from the chimneys when there is little wind, pooling in particular spots on his land and around his yard, even gathering in certain buildings and under particular trees. He points out where 'the caustic' has literally scorched the leaves on trees, and damaged entire branches of briars. Amongst the many carefully-kept documents that Pat has in his possession is a report by the EPA from during their Askeaton investigation, which rules **out** any disease or fungus as causing this damage to the vegetation.

"It gets caught under these trees and takes the leaves off them," he says, pointing to an arbor. "It shrivels them up. If the leaves are dry and you go to pick them up with your hands, you find your hands burning. So whatever's burning the leaves off the trees stays on them, and will sting your hand."

Reaching the yard again, Pat rummages in the car and pulls out a colour A4 print of what the Geoghegan's cottage used to look like. It reminds me of a John Hinds postcard – traditional native Irish, beautifully-kept, with flower-boxes on the window-ledges in full-bloom. Now the place has an air of dilapidation. There are family belongings scattered in the four small rooms. It has the feeling of a building that was evacuated in a rush, with no time to gather and tidy. The hearth looks empty and deserted. A proud photograph of the two Geoghegan girls, Meghan and Amanda, hangs on the wall. There are teddies on the floor of their bedroom.

Pat describes how the emissions crept into his home.

"They'd be much worse than the red dust," he says. "They'd drive themselves down at you. Through the doors, the windows, down the chimney. You'd smell ammonia and sulphur. You'd feel it burning and you'd feel it, gone into your chest. And the way you'd know you were very badly affected was that you would be pissing for ages. Or you'd be sweating like crazy. Because your body was trying to detox.

"WHATEVER BREATH IS IN OUR BODY, TOXIC OR NOT, WE'RE NOT GOING TO GIVE UP UNTIL WE UNCOVER WHAT HAPPENED"

"The body tries to detox itself, even though you know this stuff is going to be let into your kidneys or your tissues and it won't be able to get it out, and that's going to do the damage. But the body is still trying to get it out. Sweat, urinating, diarrhea. You couldn't sleep. And when you did, you'd wake up with a metallic taste in your mouth.

"I remember when Amanda was about five, asleep inside in that room, we'd be outside milking our cows, and on one of the bad occasions, we felt the burning and we ran in because her window was down. And to make sure she wouldn't get it, we closed the window. And later when we came in and we looked down at Amanda in the bed, her whole side of her face was raw red. We realised that we had it trapped inside her room.

"I was on the phone that time trying to get Brian Cowen. He was Minister for Health at the time. He'd do nothing for us."

The 2001 EPA report effectively denied any responsibility on the part of the State towards the people of Askeaton. Pat, however, continued to write to the EPA, describing episodes of fall-out that were sometimes so bad that he and Nuala would have to waken their sleeping children and flee for the night, until the pollution had blown off their land.

"There was so much stuff coming onto our farm," says Pat. "At times we could only go on our farm for five minutes because of the pollution. But no one would do anything for us. When Nuala was pregnant, her gynacologist told her to get out of the place when the pollution came. We'd have to rush her into the car and get her out of there.

"We have a letter on record one time when she was pregnant," says Pat, " and she got a pain in her stomach because the stuff was around the yard. We wrote to the EPA and said she was pregnant. The next time she went for a scan, the baby was gone. She had three miscarriages – and no one would do anything for us. The State just left us to suffer."

After years of exposure, the Geoghegans have developed what he calls 'multiple chemical sensitivity'.

"The pollution that Nuala gets from Aughinish," he says, "it automatically makes her sick. Once it hits her stomach she'll throw up straight away. I've seen her down on her knees beside the hay barn, vomiting trying to get the pollution up. And that happened to her when she was pregnant. No one gave a damn about our babies.

"We used to get massive pains in the head. Our heads would nearly explode from the stuff. You'd feel it sizzling in various parts of your head. And the muscle and joint pains! Oh Jesus, you couldn't get up out of bed with them. The fatigue – we were going to doctors getting vitamin B12s into the backside trying to keep going, it was that bad. Pains in the stomach was another one. It would turn your stomach. There was a terrible skin rash. You'd have ulcers around the back of your neck and there'd be puss inside them. Your legs would be the same.

"And the only thing that happened in the EPA human health investigation was that you filled up sheets if you were sick. You'd say, I have a chest problem, I have fatigue, and you'd put a 1 to 5 on how severe it was. That was the only thing they were asking us! They were blooding animals, but they weren't blooding the humans. We felt that it wasn't on."

Incredibly, the Geoghegans had to insist that their blood samples should be included in the health investigation. Pat says that the people

CONTINUED FROM PAGE 59

Deception (2004), the award-winning investigative reporter and television producer Christopher Bryson documented how fluoridation of public water supplies was initiated and promoted by fluoride-polluting industries in the United States, to help mask the problems of fluoride toxicity among workers and communities living alongside fluoride-emitting industries. In Bryson's analysis, the working assumption was that if you medicate the whole population with fluoride, it is much more difficult to point the finger at industry for fluoride intoxication.

Water fluoridation allows for low-level intoxication of the population and thus, as disease burdens increase within the wider community, it masks the higher burdens of such disease that may exist among workers or communities directly exposed to fluoride pollution. For its proponents in the US, fluoridation was also a means for industry to get rid of highly polluting, toxic waste.

Seen in this light, the closing comments of the EPA's report – with its glib assurances that neither animal nor human health are in danger from pollution in Askeaton – are positively chilling.

"In summary," the report said, "while the findings in regard to the causes of the animal health problems have not been as conclusive or precise as the two farmers directly involved, as well as the wider community in the Askeaton area, would have wished, the information collected *has enabled a number of possible causes to be largely ruled out of consideration* (our emphasis). While this may appear to be an unsatisfactory outcome to some, it is hoped, nonetheless, *that it will give assurances that the problems were not due to agents, particularly environmental pollution, with a potential to cause area-wide harm, both to livestock and humans* (again, our emphasis). …

"In one sense, the more detailed work which had to be undertaken [as part of the study] may have been useful if it can provide some assurances in the future of the compatibility of industrial development with farming in the Irish countryside."

The disgraceful evasions of its conclusions notwithstanding, the EPA report did include some recommendations for animal health, including the establishment of a National Toxicology Centre to provide comprehensive expert support for the investigation of suspected pollution incidents which adversely affect human, animal, or environmental health; and also that the Department of Agriculture Food and Rural Development should undertake, as a matter of priority, the establishment and maintenance of a database to record the national incidence of common indigenous diseases of livestock. As for human health, they recommended that a computerised system of monitoring congenital abnormalities should be established as well as a system of surveillance of morbidity in general practice.

Over twelve years later, to our knowledge, none of these recommendations have been activated. Nor has the Department of Health undertaken any survey of the dietary exposure of the general Irish population to fluoride. To some, their reluctance suggests that they have something to hide. Perhaps they have.

Meanwhile the entire population of Ireland must endure the insult and injury of fluoride being added to their water supplies, beverages and food products, with no method of accurately gauging their total dietary exposure.

The Geoghegan family farmyard

heading up the investigation "played the fool", letting on that they didn't know what to look for in the blood samples. Pat found out himself what was in the atmosphere, when another local person took an air sample when emissions were on his land. He told the EPA what to look for.

He recalls a particularly severe fall-out that occurred in 1998. Amanda, the Geoghegan's eldest daughter, was five at the time. Nuala was hanging out the washing, Amanda by her side, when they shouted out to Pat, "The pollution is here! It's under the clothes line!"

"I went over and I got it straight away in the chest. I could hardly breathe. I was so bad that time I ended up in hospital. I actually went blind for a while in the car on the way to Limerick. Nuala was driving me. When they first looked at me in the hospital they thought I'd had a heart attack – the stuff messes up your system so much that the body gives readings of a possible heart attack. But I hadn't had a heart attack that time. They left me out of hospital after four or five days."

The blood samples that the Geoghegans supplied after this particular bout of poisoning were amongst the 20-odd samples of blood, urine, hair and nasal swab samples that were 'lost' by the health board.

It is a relief to get away from the Geoghegan's forsaken farm. I had felt it strongly: the pollution is an evil presence there. As we head back to Pat's parents house about 10 miles away from Askeaton, where they now live, Pat does not look at all well. For a week after our tour of his farm, Pat is laid low with fatigue and respiratory problems which require medical attention. While they believe the air quality is still poor where they are living, the exposure is nothing like as bad as on their farm.

Nuala cries when she tells me about the time she and Amanda got caught under the clothes line. They didn't realise how badly five-year-old Amanda had been exposed. Amanda is now 21, and to this day she has experienced health problems – including chronic fatigue and pains in her joints – to the extent that she cannot lead a normal life.

"She seemed all right at first," Nuala says, "but within a few days, the energy just flowed out of her. That was the start of it. She got so weak and ill, she was saying 'Mammy I can't run'. She couldn't stay awake, and she started getting pains in her stomach. This was all within a week of being exposed.

"A week and a half into it she couldn't stand up with the pains in her legs. I was in and out to Dr Teahan, a lovely local doctor. She's deceased since 2001. She didn't know what was wrong with Amanda, so she rang the people heading up the health section of the EPA investigation, which was going on at that time, and arranged for Amanda to be taken into the Regional, where five vials of blood were taken from her to be sent off and checked for toxins. And I thought: 'thank God there's going to be an explanation for what's happened my daughter'."

The Geoghegans never did find out what was in their daughter's blood. Those samples went missing too. A couple of years ago, she tried to go away to college, but has been back living at home for the last year.

"There's so many things she can't do," says her mother. "She had it all throughout her childhood. She got more exposures since, like we all did. With every exposure she got pains in her chest that would be 10 out of 10. Our old doctor was very supportive. She believed us about the pollution."

There is a nine-year gap between Amanda and her now 12-year-old sister, Meghan, who the Geoghegans refer to as 'their miracle child'. Nuala's three miscarriages, in the intervening years, happened during times of pollution fall-out.

"We each mirrored the problems that the cows were getting," says Nuala. "Pat the coughs, and me, the female things."

I ask after Meghan's health.

"It's affected her speech and memory," says Nuala. "Her speech was delayed and her sentence structure was affected. A lot of the symptoms are comparable to what fluoride poisoning does. She also has a kidney problem. There's always traces of blood in her urine.

"Only last January I had to go up to the farm briefly and I had to take Meghan with me. I turned around and she was bawling crying. She had gone blue. She had a ferocious pain in her chest, which was coming up her neck, into her gums and out her tongue. She couldn't breathe. Now because of Pat's history, we got her seen by a heart specialist, but he said it wasn't a heart complication. The doctor said it had to be some kind of exposure."

"We know we're damaged," says Pat. "But our daughters have grown up in it. What's the long-term effect on them going to be? What problems do they have coming along? That's where our real concern is."

"And they've lost their inheritance," says Nuala. "We had to leave our beautiful farm. I can tell that Meghan has a natural instinct for animals. But she'll never be able to farm in Askeaton."

I ask Pat and Nuala whether they know people from Askeaton with comparable ongoing human and animal health problems.

"Yes, plenty," says Nuala. "But they don't want to speak about it. They're broken."

The pollution got particularly bad in 2007-9. The Geoghans sent many emails to the EPA describing their ill-health from fall-out. On October 8, 2009, whilst working together outside, Nuala looked up to see a large cloud heading for their farm from the direction of the Aughinish chimneys. She took a photograph of it.

"The next thing I couldn't breathe," says Pat. "It was in my chest. The cloud was going over in the direction of the school where our young lady was, and because of how sensitive she is, we rushed and collected her out of the school. We came back four or five hours later and the cloud was gone."

Pat's chest pain did not go away. Two days later he was in hospital, having had a heart attack. He now has a stent in his heart.

"We've had dead animals whose lungs have been nearly closed up with solid casts," he says. "I said to my doctor two weeks before the heart attack, could I end up being the same as the cattle? And it nearly happened to me.

"I told them in the hospital that it was this cloud that caused it. When I went to check for my results of that night, my ECGs were gone, just like our bloods. I have the letters showing that. I'm two years trying to get them and they still can't find them."

Pat laughs sardonically. "How unlucky can I be?"

The day after the cloud exposure, before he ended up in hospital, Pat took a urine sample, which he had tested. Scientist Declan Waugh has looked at the results. While fluoride levels were not specifically tested for, Waugh could see signs in Pat's results that indicated fluoride poisoning. This is his written response:

"Exposure to chronic levels of fluoride, either ingested or inhaled, causes precipitation of calcium ions in the blood, and blockage of heart contraction resulting in cardiac arrest. The calcium levels measured in the plasma of Pat were extraordinarily high just before his heart attack, suggesting that acute fluoride poisoning may have been a direct cause of his heart attack.

"Furthermore, a major scientific report published in the journal *Toxicology International* in 2011 warned that: 'Fluorides also accumulate in soft tissues resulting in increased production of free radicals. Intensified free radical production or disturbed antioxidant level leads to oxidative stress which is known to be a key etiopathological factor in a variety of cardiac diseases, such as heart failure and ischemic heart disease'.

"Ireland has the highest prevalence of premature mortality from ischemic heart disease in Western Europe," Declan Waugh adds. "It is beyond negligent that the HSE continue to ignore the science demonstrating the often lethal long-term effects of fluoride intoxication on our population. The health statistics for this country clearly demonstrate how fluoride is contributing to chronic disease here."

Says Pat, "Nothing has changed, since the first day the EPA investigated back in 1997. We're only farmers. We went to the State for help, and this is what they did to us. Are we going to be left to die?"