
by F.D.T. Good, M.R.C.V.S.

I live and practice in Tenterden near the village of Smarden in the Weald of Kent where there is a small factory, which makes orchard sprays.

In January 1963, a man who worked at the factory brought a four-month old Labrador puppy to my surgery. It was having convulsions and after treatment appeared to be making an uneventful recovery. Two weeks later the puppy was brought back to the surgery, together with its litter brother. Both were dead, having had fits earlier in the day. The owner suspected poisoning and wanted a post mortem examination. I explained the difficulties of this unless one knew what poison to suspect, and reluctantly he went away not knowing what had killed his puppies which had been so well that morning.

On Benenden Fair Day, a Saturday in mid-May, I was called to GREAT OMENDEN FARM where a client had lost five sheep suddenly. They were being loaded for sale. A few minutes before they appeared normal and just sank to the ground and were dead. This was a mile from the factory. The post-mortem examination revealed nothing of significance to indicate the cause of death. I was baffled. The Veterinary Investigation Centre at Wye had closed down for the weekend. A sixth sheep died at Benenden Fair and a seventh with the new owner at Rye. Sheep can die suddenly from a number of infectious diseases but there was no reason to suspect any of these.

The farm manager asked me whether I had heard about three of his neighbour’s cows, which died a few days before. This was Mr. Jull and his sons Cyril and Norman at Roberts Farm. It was a fine afternoon and this was my last visit of the day, so we took a walk along a stream, which ran through his neighbour’s land. We noticed that the further we went upstream, the less clear the water became. The vegetation in the ditches was black and dead. The stream originated alongside the factory, which made pesticides. The water on which the cattle and sheep depended for drinking water became suspected. Water samples were collected and internal organs from the dead sheep were taken to the County Analytical Laboratory at Maidstone. Telephone calls to my neighbouring veterinary practice at Ashford established that they had been attending three cows at Roberts Farm. We were mystified. They knew the factory made methyl bromide, and one of the ponds smelt of bromide.

The following day, Sunday, I was called urgently to attend a goat at Limes Land Farm which lay directly across the main road from the factory. This client used to work there and I asked him what they made. Amongst the many pesticides he mentioned was fluoroacetamide (1081), a rat poison. The goat was trembling and in a convulsive state. She died a few hours later.

Many meetings transpired between the Ashford veterinary practice, the factory manager and myself. Analytical test results began to come through. Fluorides were present to the extent of 5 parts per million, but bromides were a hundred times more. Sulphuric acid was also present in the water. The sheep specimens revealed no chemicals of any significance. Testing of the ditches and ponds for bromides were carried out at intervals. The acid had been neutralized by the factory management with washing soda and only bromides appeared to remain. Testing for fluorides was abandoned in view of the
alarming quantities of bromide present. The Kent River Board, responsible for the prevention of pollution of watercourses was alerted. The factory manager told me that fluoroacetamide could not possibly have got into the ditches, but he was able to account for the bromides and acid. The black chemical residue from the manufacture of fluoroacetamide had been pumped out onto the factory land for months and the Kent River Board assured me that this could only be carried downwards into the soil.

All ditches and ponds on Great Omenden, Kelsham and Roberts Farms were fenced off to prevent access by livestock. The remainder of the young Friesian herd on Roberts Farm was kept under close observation by the Ashford veterinary surgeons. No more deaths occurred and we felt a little easier. We had at least prevented further deaths.

Mr. Lowe, the farmer at Great Omenden, also kept pigs, poultry and cattle, as well as two pet dogs, one of them a sturdy and obedient foxhound. A month after the sheep deaths, and after all acid had disappeared from his ponds and ditches, the foxhound was taken ill at night. I will use the housekeepers words: “At 1 am he jumped onto my bed, a thing he never does...his eyes staring and big...trembling a little and teeth bared as he panted and seemed mad...I was frightened...I let him out of the bedroom and he fell downstairs...he stumbled out of doors and went onto the green...there he fell over, head bent backwards and his legs kicking as he gasped for air...a horrible noise from his throat as he breathed...his eyes were very big...then he got up, looking wildly around, then shot away and we did not see him again alive.”

His actions were suggestive of fearful hallucinations. The following morning he was found drowned in a pond. A post-mortem examination in the forecourt of my surgery showed only the signs of death from drowning, and the big meal he had eaten the evening before was undigested in his stomach. The owner could not accept my post-mortem certificate. What had caused the madness before he bolted away in terror? I explained this as being due to severe abdominal pain and colic. The dog had been out hunting the previous afternoon and given a big meal on his return that evening, when he was in an exhausted condition. Mr. Lowe was still not satisfied. He had lost sheep, his neighbour had lost cattle, this was still poisoning! But how could it be? The water analyses for acid and bromide were almost normal, and the bromides, if responsible, would only have a sedative effect and not one of stimulation. Doubt grew in my mind. The Veterinary Investigation Centre was not so concerned with dogs, and besides they would be reluctant to intervene as litigation might be involved.

Meanwhile the cows at Roberts Farm were reported to be normal to the casual observer. Cyril Jull knew their milk yields had fallen, they were less alert than usual, and they were easily tired. If made to hurry, they would stop and pant like a dog. A few calves, which were born strong and healthy, died in convulsions before they were a few hours old.

Mr. Patterson, the Ministry Veterinary Surgeon at Wye was again pressed to come to our aid. Yes, he was willing to do so if we could tell him what poison to look for. The factory sold scores of pesticides, from the more complex chlorinated hydrocarbons, DDT, Lindane, Parathion, down to the simpler copper, arsenic, zinc and sulphur ones. Was one to start at the top of the list and work down, or try one’s luck with a pin? The de la Warr Laboratories at Oxford offered me their help and in July a team of three visited Tenterden and took apparatus out to Roberts Farm. Within minutes of setting up their apparatus they diagnosed fluoroacetate (1080), much to the surprise of the farmer and myself.
I hastily made use of the library at the veterinary centre, and examined all available references to fluoroacetates, both veterinary and medical, published in Australia, America and Britain. The action of this poison is to interfere with the supply of nourishment to the brain and other organs such as the heart and kidneys. The normal body processes actually assist in self-destruction. This remarkable state of affairs was first discovered by Sir Rudolph Peters.

Testing started again for the fluorides in the ponds. These revealed between 3 and 23 parts per million (ppm). The Medical Officer of Health was not concerned by this; many parts of the world have over 5 ppm in the drinking water and this causes no apparent harm, so they say. Tea had 100 ppm. They were not aware that the fluoride in Smarden was organic, whereas the other was inorganic and much less poisonous by comparison. Certain plants in Sierra Leone and South Africa have the power to convert the inorganic fluoride to the very poisonous kinds. The long-term effect of a widespread introduction of trace amounts of foreign inorganic fluorides to water is not known.

The normal fluoride level of water in this part of Kent is between 0.2 and 0.3 parts per million. Any quantity above this is foreign to the water. The testing of water and plants to distinguish between inorganic and organic fluorides is difficult and can only be undertaken by a few specialized laboratories. The position in regards to reliable tests for fluoride chemicals in foods, beverages and water is inadequate.

My post mortem examination of the foxhound showed one peculiarity only to be noticed weeks later. The concrete near the drain where I carry out such work is always washed down immediately afterwards. This time, the blood stains did not wash away, and six months later the tell-tale spots are still obvious.

The casual observer of farmer Jull’s cows would see nothing amiss. Perhaps the farmer was imagining things, you could not really say they were ill merely because they were giving less milk, or they seemed sleepy. Their bodily condition was good. However, by mid-July, two months after the first series of deaths, some of the cows developed swellings under the chest and jaw. Two cows were sent to the Central Veterinary Laboratory at Weybridge. One by one, they gradually died and by the end of September only 11 of the original herd of 26 young cows were alive. Every calf that had been born since May had died. There was no known treatment.

On September 30th, which happened to be Cyril Jull’s birthday, the remainder of the herd were destroyed and burned. Their flesh was highly poisonous. The local horse slaughterer who collected the previous dead cows, lost two of his own dogs which accidentally ate a little of the meat. These dogs went through the same ghastly and cruel deaths suffered by the foxhound in June and which was repeated in the 75 dogs and cats in Merthyr Tydfil, South Wales. The pyre burned for three days and the ashes, which may still have been poisonous were buried eight feet deep on verbal advice from the Ministry of Agriculture.

By now, the factory undertook the emptying and cleansing of all contaminated ditches and ponds. Water was transported in a fleet of tankers to Dymchurch. Here it was tipped into the sea on an outgoing tide. The harbour authorities would not permit the sludge to be tipped there, so that was transported back to the factory land from whence it came.
A trench was dug around three sides of the sludge on instructions from the Kent River Board and to prevent further seepage of the poison.

In mid-October the Ministry of Agriculture sent two cows from Weybridge. They were to act as guinea pigs to ensure that no further danger remained. They were allowed to graze the grass, but not permitted to drink the water, which by now, had refilled into the ditches and ponds following the high rainfall.

Cyril Jull’s land was quite and sterile. He had been stopped selling his milk, and now he was unable to sell his crops. Nobody would risk feeding the hay to livestock. He spent his days no longer milking and caring for his Friesian herd, which had ceased to exist. He spent them scrubbing, cleaning, plastering & painting all the buildings, looking forward with hope that by spring he would be permitted to restock his farm. Cyril and Norman, following their elderly parents, had built up the farm over 30 years.

These events take no account of the wild-life, the birds, the rabbits, the nomadic cats, part owned and part lodgers. None were left. The house-martins never came this spring, and there was no bird-song in the hedgerows. The only rabbits were a few young ones, picked up dead in the ditches. The subject of Rachel Carson’s book Silent Spring had become a reality here in the heart of the Garden of England.

Cyril Jull is always cheerful and greeted me with a smile, even under such adverse conditions. He is a wonderful character; his neighbour described him as one in a million. He has never grumbled about his misfortune. He bears no animosity towards the factory next door and greets its manager when he sees him wandering across Roberts Farm to take water samples.

Fluoroacetates in the form of fluoroacetamide has been sold in Great Britain for a number of years as a pesticide against greenfly and blackfly, to both farmers and gardeners. It is also sold as a rat poison. Many householders keep fluoroacetamide on their larder shelf. The 3/6d small size bottle was bought by children without restrictions from chemists, hardware stores and florists. This bottle contains 1/20th of an ounce of the poison, which is sufficient to kill 1,200 dogs of terrier size. It is still available at some shops other than chemists. The Home Office banned its sale in December but many households do not know the trade names under which they have been purchasing this killer (one of the brand names in this case being 1081 - editor). Farmers have been using fluoroacetamide for years for spraying broad beans, brassicas, sugar beet and strawberries. Neither washing nor boiling removes the fluoroacetamide if the crop was harvested too early after spraying. The amount permitted to spray one acre of these edible crops will kill 75,000 dogs.

The Home Office regulations still permit its use as a rodenticide, but primarily in sewage, supposedly well away from humans and animals. Inland sewer treatment works discharge a clear and so-called “pure” fluid back into ditches and streams. The River Boards are not able to detect fluoroacetamide. The Kent River Board was told about it in May, and they have been unable to detect it. They told the local authority that the effluent was safe and the water fit to drink. The doubting Thomases may say the dilution will be so great in sewers that it cannot possibly hurt anything. I know that one part in ten million, and possibly less, can accumulate within the body and this can be fatal to cattle and dogs, if such polluted water is their only source of supply. Not all animals
accumulate the poison in this way, and the sewer rat is one of them. The dog is a hundred times more sensitive to this poison than the sewer rat. Reliable tests will have to be conducted on at least three species of animals, and for a period of several years, to enable scientists to arrive at definite conclusions as to the possible chronic poisoning effects of these foreign chemicals when they are present in such trace amounts, and for which there is no known chemical test.

Fluoroacetates were known in the last century and had been used as an insecticide in mothballs 30 years ago. They developed a new look in Great Britain during the last war, when they were made for the Ministry of Supply as potential chemical warfare agents. The trade preparations contain a dye, a bittering agent and another chemical in efforts to prevent their lethal effect if accidentally taken. Regrettably these are of no avail to domestic pets. Evidence now available has shown that dogs, like rats, prefer the water tainted with poison to pure water, and with fatal results. The factory stopped making fluoroacetamide in the middle of the year. They wrote and told me their chemical wastes were being taken to Essex and tipped into a disused quarry near Glemsford.

A workman employed in cleaning the ditches in December lost his own cow. He was not told to wash his boots before walking home to feed it. There may not be conclusive proof of the cause of death but the circumstantial evidence is overwhelming, as it has been since last July.

One of the two guinea-pig cows sent to Roberts Farm died just before Christmas, with the well-known clinical pattern before death. At the meeting of the West Ashford Rural District Council on February 17th, it transpires that the two guinea-pig cows may have had access to flood water on November 24th and this water supply may have been the source of the fluoroacetamide which killed them, as announced by Mr. Soames in the House of Commons on February 4. Tests of this pond water before these dates showed no abnormal contents of the water. Fluoroacetamide was registered in the U.S.A. for the first time in 1963. Its use there is based on recommendations of the Ministry of Agriculture in Britain. They had never published recommendations for its safe use as a rodenticide, although they refer to such recommendations in their literature.

The fluoridation of public water supplies might well be re-considered in the light of these events, and the Kent County Council have seen a light. Extra foreign fluorides may increase the likelihood of plants making the poisonous fluoroacetates about which so much is known by so few.

Criminologists are continually on the alert for new types of poisons which might be used in irresponsible hands for committing the “perfect murder”. Some of the requirements for such a poison include the following: (1) It should be inconspicuous, particularly in regard to odour and taste, (2) It should be sufficiently stable to withstand rather drastic conditions, such as suspension in hot tea or boiling coffee, (3) It should operate with a delayed action in order that the murderer cover his tracks before death occurs, (4) The poison should induce no obvious pathological changes which could be spotted at post mortem examination and lastly (5) There should be no reliable means of analyzing for residual traces of the poison in the body of the victim. It will be seen that fluoroacetates satisfy these requirements to an alarming degree, and they are in the category of being the most poisonous substances known. Fortunately modern biochemical work on the action of the poison is providing some means of recognizing that it has been used.
The Smarden factory is reported to have moved its plant elsewhere. Which will be the next household or town or district to be grieved by these events? Can further tragedies be stopped? I consider there is only one sure way of doing so. The total prohibition of the manufacture, use and sale of fluoroacetates in Great Britain would cause hardship to nobody. The British Veterinary Association has been urging a total ban, though this has been given little publicity. This is not a parochial subject, but an international one.

On Christmas Eve, The Ministry of Agriculture’s Central Laboratory has concluded that fluoroacetamide and/or fluoroacetate have been directly responsible for the Kent and Merthyr Tydfil tragedies. This exacting and precise research has been made possible by the free and generous help of Sir Rudolph Peters (M.C., M.D., F.R.S.) of Cambridge, with whom Dr. Ruth Allcroft of Weybridge has worked in close association. Their joint efforts merit recognition.

My story would not be complete without tendering my grateful thanks to many veterinary colleagues in the Home Counties, my local chemist, the Local Authorities of Tenterden and West Ashford Rural District Councils, Dr. Rachel Carson who so kindly provided American references, Professor Steyn, Chief Research Officer of the Atomic Energy Board in the Republic of South Africa, Mr. D.H. Phillips of South Wales, and numerous other scientists and non-scientists who have been so sympathetic and helpful.

The events in Smarden, South Wales, and other individual households, might serve for us to take a more forceful look at the many other pesticides about which we have been warned.

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