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# Chemicals: the fatal flaw

Agricultural chemicals have been responsible for some of the most terrifying and dramatic damage to our environment. Their frightening potential as pollutants has been known for many years, yet there is still in this country a major flaw in the voluntary agreements covering their sale and use. In at least one case this has been responsible for the gross pollution of a river, resulting in the deaths of many hundreds of fish.

The story of Santobrite, marketed in this country by Monsanto Chemicals Ltd., of Victoria Street, S.W., is a sharp reminder that constant vigilance is essential.

Monsanto marketed Santobrite without any warnings on the packets that it was highly poisonous to fish and must not be allowed into a river or watercourse.

In August, 1968, officers of the Lee Conservancy Catchment Board discovered that the chemical had polluted Cobbins Brook, Waltham Abbey, Essex, and killed several hundred roach, bleak and minnow. They found the lack of warning on the industrial packets "most disturbing" and wrote to Monsanto.

Mr. Ronald Toms, the Lee board's water protection officer, said in the annual report: "This substance had been used at a nursery for sterilizing mushroom boxes. A most disturbing feature of this incident was that although the manufacturer's agent supplied retailers with literature giving warning that Santobrite would kill, among other things, plant and fish life, no such warning appeared on the retail packs in which the substance was sold."

The report goes on: "Accordingly the board took this up with Monsanto, who agreed that at the earliest opportunity the retail packs of Santobrite would be clearly marked to the effect that the substance was poisonous to fish and must not be allowed to get into a watercourse."

Monsanto confirmed that this was correct. They said they had been approached by the Lee board in November, 1968. They investigated the incident and later invited the board to suggest the wording of a new label, which was introduced last October.

But Monsanto's labelling difficulties were not over. The Ministry of Agriculture told us that it had asked for further changes. Monsanto at first denied this but yesterday telephoned us to say that the Santobrite label would be changed "as soon as is physically possible."

The Ministry says the new label will have to state that Santobrite is harmful to persons, especially children, fish and livestock. It will also have to state that the product should be kept under lock and key, and exhort caution in the disposal of the container packet.

It is important to make clear that although Santobrite is used by farmers it is marketed as an industrial not an agricultural chemical. Therefore Monsanto were under no obligation to submit it to the Ministry's agricultural chemicals approval scheme. The Ministry told us that many other brand name chem cals were almost certainly in the same position and that it regarded this as a serious flaw.

This is a voluntary scheme, and Monsanto does have agricultural chemicals approved under it. The approval scheme is linked with the pesticides safety precautions scheme. In that the manufacturers "agree not to market a product containing any new chemical for use in agriculture or food storage, or to introduce a new use of a chemical already on the market, or to introduce a new formulation that could show an increased hazard, until recommendations for safe use have been agreed with the government departments concerned."

In fairness to Monsanto it should be said that the label on the individual packets of Santobrite and the literature available from the company in no way attempt to dissolve the dangers.

Its technical bulletin says that sodium pentachlorophenate, Santobrite, is not a scheduled poison, but gives warning that "if improperly handled, [it] may be harmful to human beings and if taken or absorbed in sufficient quantities may, like many other chemicals, prove fatal."

What the Ministry would like and what Monsanto already has on the packet seem to differ only in detail. The incident at Cobbins Brook emphasizes that details are of immense importance if the danger of chemical pollution is to be lessened.

Chemical pollution has produced a new kind of scientist constantly on watch for signs that unnatural and unwelcome changes are taking place in our environment. Their work has led to the withdrawal of some chemicals and a limitation in the use of others.

A great deal of research into the sub-lethal effects of chemicals is being done at Monks Wood Experimental Station, Huntingdonshire, part of the Nature Conservancy. It enjoys a quiet, rural setting along a narrow lane. A tangled copse along one side provides a bird sanctuary. Inside the main hall a giant deep-freeze, packed with poisoned birds, is a stark statement about some of the problems that have to be faced.

Mr. John Parslow, who is investigating the deaths of many thousands of sea birds in the Irish Sea last year, told us: "I and others sometimes describe our work as like that of the miner's canary."

The initial investigation into the deaths of the sea birds established the presence in the birds' organs of an insecticide chemical called dieldrin. Dieldrin, which is DDT, oil pollution and other factors, bad weather and hunger, would have contributed to the birds' deaths. It will be some time before the part played by the chemicals can be established, if at all.

If it is established that PCBs (polychlorinated biphenyls) in certain degree are lethal, another question arises. Birds can store quite large quantities of chemicals in their body fat which are released into the organs when the fat is used up during times of stress, such as hunger, bad weather and moulting.

If PCBs are found guilty, it will then be necessary to try to discover at what level of concentration in the fat they are potentially lethal; if this level is likely to be maintained because of pollution of the Irish Sea; and, if so, what can be done to reduce it.

As with many other birds that have died from chemical pollution, the guillemots in the Irish Sea were at the end of a food chain. The significance of food chains is simply that, as one link in the chain feeds on the one immediately before, the concentration of chemical can increase until at the end of the chain it has become a fatal dose. Therefore quite small, apparently harmless concentrations of a chemical can eventually prove fatal.

For the layman one of the most interesting techniques used in the detection and measurement of chemicals is gas-liquid chromatography (GLC). The machine produces varying sized "hillocks" on graph paper, and according to their distance from the starting line, and their height, established which chemical is present and in what quantity.

It is like a chemical fingerprinting machine, and on the river Lee, which provides London with a third of its drinking water, fingerprinting different brands of oil has begun, because this is a serious pollution menace in the river.

Mr. Toms, who was quoted on the Monsanto incident, told us that oil pollution was an increasing threat. Only recently 1,000 gallons had spilt into marshland bordering the Lee, when two men had stolen brass valves from a storage tank at a nursery.

He said they were caught almost immediately because they were engulfed by the oil and left an unmistakable trail. But their action threatened the Lee and only the prompt and costly building of an oil barrier prevented serious pollution.

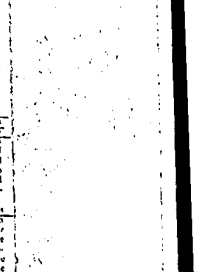
The Lee is now in a condition that many if not all the highly polluted rivers we reported on earlier will have to attain within a matter of years. Therefore Mr. Toms's views on the loopholes in the existing legislation should be noted.

Oil pollution is a growing menace, yet there is no legislation in England and Wales demanding retaining walls around storage tanks. It is simply a matter of damage to property, in itself serious enough. Mr. Toms told us: "If pollution can make the water unacceptable for cooling on it is very bad, for cooling power stations.

There are two chemical factories in the Lea Valley, both are cooperating in schemes to reduce the possibility of accidental pollution of the river by surface water which is chemicals as it runs from the factory area.

The catchment board's 1968 report, however, stated: "It is a fault in the legislation that such firms are able to store highly dangerous chemicals in such positions that an accident can result in pesticides entering and causing considerable damage to a watercourse."

The Lea has had its blood by toxic rumors from rubbish tips polluting the river. Mr. Toms told us: "Ideally we should be consulted before a tip was used. But often, especially when planning authority is



A tip on Essex marshes, where [illegible]

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# Reuters

## a News Team Inquiry

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... ...k County Council, ... ...ouncil, similarly, has ... ...ic figures in at ... ...ast one of the tips, appar... privately named Mucking Marsh, is very relevant. It is likely in the near future to ban any further liquid tipping, because there is serious concern about the effect on underground water supplies.

It must be emphasized that constant testing of the water being drawn from the area around the tip for drinking or industrial use has never shown any contamination from toxic liquids being dumped on Mucking Marsh.

However, only a part of the tip is used for dumping toxic liquids; after a specialist report in 1968 said that there was a serious risk of contaminating the underlying chalk.

Mr. M. E. Round, public health inspector to Brent County Council, told us that he expected the council to take steps shortly to close the whole tip to liquid dumping. The underlying chalk mentioned in the report is part of a huge basin that provides London with 45 million gallons of water every day. This is about a third of the supply.

Since the area has to import water, the importance of the chalk aquifer cannot be underestimated. The ban on toxic liquids will be imposed because the area is certain that they are not slowly seeping into the chalk and threatening water supplies.

Mr. Round told us: "We are backboned to death of the future."

Mr. Leo Pritchard, a county planning officer who recently completed a two-year study of the problems facing the county over the dumping of domestic and industrial waste, said: "It is not enough just there are areas set aside for dumping with regulations about what is put in.

"What is needed is an enclosed area, guarded round the clock, so that we can be sure that nothing that could immediately, or at some point in the future, prove dangerous is allowed to be deposited. I admit I have a big ideal; this, not only the other day I saw an unmarked tanker spewing its load into a roadside ditch."

Tankers, even those going about their lawful business, are a source of serious concern to many river authorities because of their potential pollutors in the event of an accident and the resulting spillage of their toxic load.

There have been many incidents where rivers have been polluted in this way, although the river authorities we spoke to praised the work of the fire brigades, who also try to prevent such spillages getting into sewer drains.

In Scotland an angling club at Haddington got damages when the load from a crashed timber lorry caused a serious fish kill.

That type of chemical pollution is detectable. Much slower is the build-up of nitrates, which can have two effects. The first is to encourage the growth of algae. When these die, so much oxygen is taken out of the water that it can prove fatal to fish.

A second effect is that if nitrate concentrated above a certain level can prove harmful to babies under six months because they interfere with the mechanism for removing carbon dioxide from the body.

In January this year the level of nitrates rose to unacceptable levels in supplies to the Southend Waterworks Company, which had to draw alternative supplies from a reservoir.

Mr. John Slack, the company's chemist, said the likely cause of the pollution was fertilizers being washed out of farmland. There had been a long, dry summer in which concentrations of fertilizer would have built up, and these would have been flushed out by the heavy winter rains.

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Chemical pollution takes many forms and has many sufferers; effects. It is very often accidental and industrialists tried and manufacturers alike. In agriculture there are voluntary schemes to reduce risks to a minimum, and only a knave would succeed the interests of the people involved. But only a fool would accept that voluntary as sufficient safeguard against chemical pollution.

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