PCB's poison trail

YORKSHIRE POST 9th March 1982

An incident in Japan in 1968 which caused illnesses to some 15,000 people was the first major indication of the health threat posed by the chemical PCB, explains Robert Schofield, Environment Correspondent, in the second part of his investigation into the dangers of the chemical

PCB's POISON TRAIL

In the spring of 1968, a small number of patients visited doctors in Japan complaining of swollen limbs, discharge from the eyes, acne-like eruptions of the skin, vomitting and headaches.

...../5

Over the next few months, the trickle of patients became a torrent with some 15,000 people in all affected, about 1,000 of them seriously.

At first no cause could be found but later that year a study group at Kyushu University discovered a common bond between the victims. They all used rice oil in cooking.

Subsequent investigations found they all used on particular brand which, on analysis, was found to be contaminated with Kanechlor 400 - a trade name for polychlorinated byphenyl, or PCB.

The disease became known as "Yusho", literally "oil disease", and in the five years following, the first outbreak 22 of the 1000 sufferers studied by researchers died, 41 per cent of these from cancer.

It was estimated that the average amount of Kanechlor 400 consumed by these people was just two grams.

The Yusho incident was the first major indication of the health threat posed by PCB. There is some evidence that the hazard was at least suspected long before 1968. In an early brochure, Monsanto - the major manufacturer of PCB - told of systematic toxic effects" resulting from prolonged exposure to vapours or oral ingestion.

But the chemical's undoubted qualities in electrical and many other applications over-rode what early warnings there were.

Polychlorinated biphenyls, a derivative of benzene, were first synthesised in Germany in the 1880s. They proved to be chemically very stable, fire-resistant, good conductors of heat and to have good dielectric strength - that is they were good insulators.

...../6

For a time, no commercial applications for PCB were apparent, but with the increasing use of electricity this century they began to come into their own.

In the case of electrical transformers - which alter high voltage mains current to one suitable for particular industrial or commercial uses - a fluid is needed to surround the core of the transformer which will both insulate it from the casing and dissipate the heat generated.

Mineral oil did the job quite satisfactorily but had the major drawback of being highly flammable. The new PCB matched mineral oil's colling and insulating properties and as a bonus was extremely resistant to fire.

Commercial production of PCB got under way in 1929 in America with low flammability as the main selling point.

Soon PCB-filled units were recommended for use where fire was a special hazard: petro-chemical plants (British Petroleum has about 100 of these units), office blocks, factories, hospitals, mines, ships ... the list is almost endless.

However, as PCB became a vogue material, buyers submitted to salesmanship and PCB units were installed where no fire risk existed.

"We have found such units in the middle of fields," said Mr. Graham Haller, marketing manager of R.F. Minder Ltd of Leeds, a company specialising in re-filling PCB units with non-toxic fluids.

PCB's insulating properties also led to its use in rectifiers, condensers and capacitors, the nuts and bolts of the electrical industry.

...../7

And in addition to these "closed systems" - so-called because the fluid is contained within a sealed unit - PCB has also been used in a wide range of other products including: paints, printing inks, carbonless copy paper, adhesives, cutting oils, lacquers (including hairsprays), sealants, lubricants, hydraulic fluids, pesticides and dustr control agents.

In terms of actual products in which PCB has, at one time or another, been found, the list is virtually endless, but it includes refrigerators, washing machines, TV sets, fluorescent lights (a quarter of a million such lights with PCB-filled components were to be found in New York's World Trade Centre alone), aero-engine lubricants, aircraft hydraulic systems and vacuum pumps (used on oil rigs).

The use in aero-engines is thought to be one reason why PCB is the most widely dispersed pollutant in the world, found from the polar wastes to the tops of mountains.

For almost 40 years, PCB rode high. Monsanto promotional brochures range withterms and phrases like "unique", "enabling the fulfilment of requirements not met by other materials", "accomplish results not attainable by other materials" and "enhance the properties of other products."

But in the early 1960s, GEC in Manchester found that PCB could cause corrosion.

"It turned out that PCB was an electronic poison which corroded printed circuitry, contact breakers and the like," said Mr. Fred Waddington, one of the scientists who conducted the original corrosion research and who is now the head of GEC's Micanite division which manufactures a non-toxic PCB substitute.

During the lates 1960s and 1970s, more sinister discoveries followed.

...../8

A Swedish researcher, Soren Jensen, was looking for traces of the now-notorious pesticide DDT in marine animals around the Scandinavian coast. His samples persistently revealed the presence of an unknown chemical which, in 1966, he identified as PCB.

Disenchantment with PCB grew with every fresh incident and piece of research. In the year following Jensen's discovery, British researchers identified compounds in the systems of British wild birds as PCB.

A later study by Dr. Ian Presst - now the director of the Royal Society for the Protection of Birds - found that PCB was: "Widely distributed in Britain. In the terrestrial environment they were present in birds and their eggs from all parts of the country. In seabirds they were found in all species samples in three coastal colonies."

The highest concentrations of PCB in the livers of wildlife then reported, were found in river and lake birds in the Midlands and on the South and East coast.

Predatory birds rather than omnivorous or herbivorous ones, proved especially at risk, and Dr. Presst speculated that PCB could be a component in the breeding failure of a number of predator species because the chemical had been found to affect birds' reproductive organs and also result in them laying thin-shelled eggs.

Shortly before the Yusho incident, an accidental mass death of chickens occurred in Japan. Dark oil used in their feed was found to be the culprit. It too was contaminated by the PCB, Kanechlor 400.

A carbon copy of the Yusho incident - poorly documented in English - occurred in Taiwan in the early 1970s; 1000 people contracted the disease.

...../9

Hundreds of thousands of chickens and millions of their eggs together with tons of pork and other food-stuffs had to be destroyed in the United States after a number of incidents where animal feeds were found to be contaminated with PCB.

So far - and as far as we know - the spills that have occurred in Britain have been dealt with in time to prevent major incidents.

But R.F. Winder's joint managing director, Mr. David Bowers, believes it inevitable that innocent pollution has occurred because of ignorance.

"So few people realise that the threat exists. A lot of old transformers have already been scrapped, God knows what happened to the PCB in those," said Bowers.

"It is almost certain that the liquid has been dumped in toxic waste pits in scrapyards to leach into the soil and ultimately the watercourse.

"It's a certainty that for the last 40 years, PCB has been dumped all over the world. In some places the damage has already been done. I think that we have been lucky in Britain so far, but it's our children who are going to suffer ultimately if something isn't done and quickly."

In the UNITED STATES in 1979, 200 gallons of PCB from a ruptured transformer leaked into an animal feed plant in Montana. Contaminated feed was shpped throughout the American North-West.

When the contamination was discovered 400,000 chickens in the state of Idaho alone were destroyed. The American Food and Drug Administration estimated a further 400,000lb of poultry, 16,000lb of fresh pork and more than 50,000lb of various foods which had eggs from contaminated chickens as an ingredient also had to be destroyed.

MONS 011617

In BRITAIN in 1979, an exploding circuit breaker punctured a PCB-filled transformer at Reuben Gaunts of Leeds.

Fortunately, the site engineer warned the Fire Service not to flush the PCB away and called in a specialist firm which recovered more than 20 gallons of the chemical and 2,500 gallons of PCB-contaminated water from the transformer and surrounding area.

Drains on the site fed the River Air and had the fluid been flushed away, a major disaster would have resulted.

FINALLY :

Mr. Barry Sheerman, MP for Huddersfield East was on Radio 4 this morning reiterating his request for a register of identifiable PCB hazards to be prepared and issued.

MONS 011618