

11/188

# ATOM MILK BAN ON 150 FARMS

200 SQUARE MILES  
NOW AFFECTED

SLOW DECLINE IN  
RADIO-ACTIVITY

SUPPLIES TO BE Poured  
DOWN DRAIN

By ANTHONY SMITH,  
Daily Telegraph Science Correspondent

The ban on the distribution of milk after contamination by radio-activity from the Windscale plutonium fire was extended to an area of 200



The Daily Telegraph's Page One headline of Oct 15, 1957, and (right) milk being discarded in Cumberland

THE FIRE at the Windscale plant resulted in a release of radioactive products which spread contamination across England, Wales and Northern Europe—but how serious was it?

Of all the radioisotopes released in the blaze at the Windscale pile Number one, radioactive iodine posed the greatest hazard because of its affinity for the food chain, notably milk.

The radioactivity that escaped outside the plant (now Sellafield) in 1957 amounted to 30,000 curies, 20,000 of which were Iodine 131.

No one died immediately after the Windscale accident.

However, a note from the chairman of the Atomic Energy Authority to Mr Macmillan shows that the situation was so serious at one point that a warning was given to the Chief Constable of Cumberland that he might have to evacuate people from the area.

### Fatal cancers

With it are other papers reflecting alarm at the time, when milk from more than 200 square miles around the Cumbria nuclear plant had to be banned.

Research shows that there is no doubt the increase in the

incidence of leukaemia near the Sellafield nuclear reprocessing complex is real.

However, in spite of a report by the National Radiological Protection Board estimating that the Windscale fire may have produced up to 33 fatal cancers and serious hereditary defects, no research has directly linked the Sellafield leukaemia cluster with radioactive discharges from the plant.

The NRPB report was a revised estimate based on the inclusion of the effects of another radioactive isotope, polonium 210.

A previous estimate, based on the release of iodine and a little radioactive caesium, put the figure at 20.

In both cases the report pointed out that "at low doses and dose rates, only an upper estimate can be made of the incidence of health effects. The actual number of health effects is likely to be lower and may be zero".

It has been said that information on the polonium isotope was suppressed, but the records just released show that the scientists overlooked the importance of this isotope at the time.

The Windscale fire was caused by overheating in the reactor's graphite blocks produced by the Wigner effect: neutron bombardment displaces the carbon atoms in the graphite's crystal lattice, leading to a gradual build-up of energy at the reactors' normal operating temperature.

To avoid the hazards associated with this release of energy the pile was annealed from time to time—heated above its normal operating temperature to help release the energy in a controlled way.

But at Windscale the operation was carried out too quickly, resulting in the fuel burning in 150 channels and the failure of the cladding which holds the radioactive by-products.

## WINDSCALE FIRE

# Threat of leukaemia hangs over nuclear plant

By Roger Highfield, Technology Correspondent

The blaze almost certainly held up Britain's nuclear weapons programme.

A document prepared by the Atomic Energy Authority on Oct 30, 1957, said the loss of plutonium to the military programme would not be felt for some time.

It could to some extent be met out of higher performance by the Calder Hall (in Sellafield) and Annan reactors (known as Chapelcross, in Dumfriesshire).

However, it added that a more serious loss would be in the production of "certain other materials and this would certainly have an adverse effect upon more advanced development work".

This is the reference to production of tritium for hydrogen bombs which was performed by putting lithium magnesium cartridges into the Windscale Piles.

The ignition of one of these

cartridges may have started the fire.

The fire, which released large amounts of radiation between Oct 10 and 12, represented a watershed in British and world nuclear safety, according to Mr John Collier, the current chairman of the UK Atomic Energy Authority.

A letter from the Atomic Energy Authority to the Medical Research Council said: "There is no doubt that the state of our preparedness to deal with the many and varied consequences of the Windscale mishap left something to be desired".

When it came to setting the limit on radioactive contamination of milk, one of the scientists wrote "in making our assessment of the problem we found ourselves short of both philosophical and of quantitative information".

Milk was one of the main pathways of contamination by Iodine 131.

Yet the scientists found that

"although a tolerance level for this in water had been agreed, one had not yet been formally agreed for milk".

The limit set by the authority of 0.1 uC per litre of Iodine 131 was "sufficiently correct", according to the Medical Research Council at the time.

The military "pile" used for producing weapons material and not electricity, was the last reactor to be built without any form of containment.

The accident there triggered a reorganisation of nuclear safety procedures.

It led to the setting up of the independent Nuclear Installations Inspectorate and nuclear standards.

In the 1950s race to establish Britain as an atomic power alongside the United States and the Soviet Union, the design and construction of piles to produce plutonium went ahead at a tremendous pace.

Mr Collier, said that once the Attlee government decided in 1945 to go for plutonium production speed of construction took top priority.

It took just three years to build and operate the piles, "and they represented a great technical achievement by all concerned", said Mr Collier. "But they embodied features and procedures which we would not countenance today."

By R...  
RST fr...  
today,  
report  
ad con