

Environmental Health Department

March 15, 1972

To: All Members of the LIA Environmental Health Committee

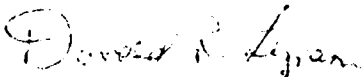
Gentlemen:

Closing of Imperial Smelting Corporation's Lead and Zinc Plant

Enclosed is a news article, appearing in the London Times, January 30, 1972, which provides a very accurate description of the situation at Imperial Smelting Corporation's Avonmouth plant. Please note the four stages of the "internationally accepted classification of lead poisoning," page 3.

Our purpose in sending out this article is to alert you to a situation which could arise elsewhere. The possibility that this situation could occur at other plants exists, because the exposure potential is the same. Under the Occupational Safety and Health Act of 1970, the official standard for airborne lead is 200 ug Pb per m³ of air. We believe that a biological standard will be promulgated in the future. You are reminded that lead is one of the five materials included in the Department of Labor's Target Health Hazards Program and you should be prepared for inspections by DOL OSHA compliance officials.

Sincerely,



Donald R. Lynam
Assistant Director,
Environmental Health

DRL:jk
enc.

LIA-76434

MUDDLES BEHIND THE LEAD-POISON SCANDAL



A worker wearing a respirator in a high-risk area

The Imperial Smelting Corporation's lead and zinc plant at Avonmouth closes down today for at least two months because it has been poisoning its workers and endangering nearby residents. The plant was to have been one of the showpieces of the 1960s white-hot technological revolution, an example, Mr Wilson said when he opened it in 1968, of our national talent.

It cost £14½ million, but as a director of its parent company, Rio Tinto Zinc, admitted last week, "It wasn't enough." It was supposed to be foolproof, the safest of its kind. But more than 100 employees have levels of lead in their blood well above the maximum safety limit. Soil and plants in the area are contaminated, and three horses have died after eating lead-poisoned grass.

In a pollution-conscious era how could all this have possibly been allowed to occur? The answers reveal shortcomings on the part of the company, a serious failure to act by the Factory Inspectorate, and government safety regulations which are at least half a century out of date.

A Sunday Times investigation

Reporters: Tony Dawe, Bryan Silcock, Wendy Hughes and Keith Richardson. Edited by Phillip Knightley

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WHEN RIO TINTO ZINC chairman, Sir Val Duncan, launched the Avonmouth project in 1966, he made a brief speech describing a new process for smelting both lead and zinc from the same lumps of rock. "The process," Sir Val said, "is one of the most outstanding achievements in the industry, if not indeed the most outstanding of the century"—words he has no doubt regretted ever since.

For the Avonmouth operation staggered from disaster to disaster. It failed to realise how difficult it always is to scale up from laboratory-sized pilot plant to massive industrial operations. Its management, left on its own for too long, became totally out of touch with the commercial realities of life. It bought equipment too cheap for the job. It did not supervise its suppliers closely enough. The heavy mechanical plant for the crushing and conveying processes kept breaking down—and every time it did it threw more poisonous lead dust into the air. Financial results deteriorated, a first attempt to change the management proved abortive and morale in the works slumped to zero.

Duncan Dewdney, the man RTZ sent in to sort out the mess in 1969, said it was the worst run company he had seen in his life. Losses continued: £2.7 million in 1969, £2.5 million in 1970.

HOW THIS SITUATION was allowed to develop and then continue for three years in

such a large company is bewildering. A similar yet smaller plant was opened in Swansea in 1960 and experienced serious teething troubles, which also created a pollution hazard. Yet the Imperial Smelting Corporation seemed to expect no trouble at all from the much larger plant at Avonmouth.

The company was told that the plant would need no maintenance in the first two years and so little back-up equipment or spares were laid in. Yet major problems developed within seven months and the complex spares were not immediately available. The management appeared incapable of effectively dealing with the situation and embarked on a "patching up" policy instead of getting to grips with the problems.

Complaints from nearby residents

The Rio Tinto Zinc board soon became exasperated, not with the pollution problem, but with the disastrous losses the company was incurring. The plant struggled to meet half its production target of 120,000 tons of zinc a year. Management changes became a regular feature of life at Avonmouth. Peter Hickey, the T and GWJ representative on the site, says: "God knows how many have been bowler-hatted." The putsch finally reached the top last year when Mr Max Fre-

eman, RTZ director responsible for Avonmouth, resigned. A group of trouble-shooters from a wide range of RTZ plants, including the successful Cockle Creek smelting plant in Australia, moved into Avonmouth. In the three years it took RTZ to sort out the place little thought was apparently given to the effects of all the inefficiency—the dangers of lead poisoning.

Money was spent on improvements but—as last week's decision to close down shows—it never worked as safely as a piece of plant correctly designed from the start.

The deep trough belt produced perhaps the most alarming failure. It carries the lead and zinc concentrates mixed with limestone, dross and sand into the processing plant. The designers specially chose the deep trough design because it can carry more material than the conventional, flatter conveyor belts and can go faster. But the concentrates mix is sticky and on occasions clung to the underside of the belt upsetting its mechanism. Belts would turn themselves over and run away, scattering up to 50 tons of concentrates over the ground, putting at risk the men who had to shovel it up, and frequently blowing dust over nearby areas.

In the sinter plant, where the concentrates were heated to burn out the sulphur, zinc and lead oxide emerged red hot and dusty. Ventilation fans took out dangerous gas, but when the fans became blocked and had to be removed for cleaning, it emerged that

there were no reserve fans. As a result workers in the sinter plant had to manage without proper ventilation until the original fans came back.

As the metal continued its journey through the plant, splashes inevitably occurred. But the drains where it was supposed to have been washed away became blocked within a month of the plant's opening and the slurry mixed with water to form huge puddles. One employee said last week, "You needed thigh boots to wade through it until someone came along and pumped it away." In the condenser plant pieces of lead and zinc would litter the floor. Faults in pumps and pipelines have meant that on occasions up to 50 tons of sludge has been left in the plant, wind blowing the dust from it in all directions.

Residents at Lawrence Weston, a mile east of the plant, complained to the Bristol Corporation which introduced a comprehensive monitoring scheme to check for lead in the air, soil, vegetables, and in the milk from cows grazing close to the plant. High levels were found in the soil and on the leaves of vegetables, and three horses died from eating contaminated grass. Thornbury Rural Council rejected planning permission for a housing estate at Hallen, a mile from the smelter, because of health risks: a wise decision because when the TUC medical adviser, Dr Robert Murray, saw the plant in December, it was, he said, "leaking lead at every pore."

The situation has been, therefore, a serious health risk for the workers in the plant and for nearby residents, for some years. Why then has nothing been done until now?



Peter Bibbings, managing director of RTZ (Britain), acting as "troubleshooter"



RTZ director Max Freeman resigned in a "putsch"

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THE MAIN ANSWERS lie in the attitude of the management and the role of the factory inspector. As the annual maintenance period at Avonmouth approaches, the plant is deteriorating and contamination rising. The management has to balance the cost of closing down early against the rising risk to its workers. On only two occasions—in 1969 and last week—has it decided to close down.

True, the company was carrying out more medical checks on its workers than it is required to do by law. But there are two important points to be made about this. One is that the relevant law is so old that it was signed by Winston S. Churchill when he was Home Secretary, namely in 1911. The second is the results of these tests—which showed that a disturbingly high number of plant workers had absorbed dangerous levels of lead—were noted by the Factory Inspectorate doctor, T. G. Faulkner Hudson. But Dr Faulkner Hudson, it turns out, is also the company doctor, not a unique arrangement, but one which must lead to accusations of divided loyalties.

A year ago the Factories Inspectorate swooped on the plant and nine men were suspended from their jobs and new rules imposed on their colleagues. The tea-trolley was banned from one area of the plant because of the dangers of the men putting "lead" fingers to their mouths; they were forbidden to wear their overalls in the canteen, and ordered to wear respirators in many new areas of the plant. Beards were banned because they could harbour dangerous dust and there was a call for short haircuts.

Naturally all these restrictions alerted the men to the risks they were running. But the management calmed them with statements similar to that made last week by the managing director of RTZ (Britain), Peter Bibbings: "Dr Hudson has been advising me over the past two years on health matters and in every case we have spent money. We have already spent over £500,000 in improving hygiene."

The balloon went up in November when one of the plant engineers appeared waving a doctor's note saying he had lead poisoning. The workers were aware that more men than usual were being suspended from lead work and the unions went into joint action. They demanded detailed information about the health of their members. The best they got was a promise that each man would be informed privately of his entry in the company's health register. The information came in the form of a medical code—saying only "1 AB" or something similar—and was meaningless to the men.

The unions finally won an explanation of the code and an agreement that a doctor of their own choice—Dr Murray—could visit the site and report on the conditions. "I found a pretty shocking situation," he says. "I read the Riot Act and the firm realised they had not done the job as thoroughly as they should. The designers were obviously more enthusiastic about the technology of lead and zinc smelting than about the effects on people working in the plant."

Dr Murray's investigations showed that 24 workers had a level of lead in their blood of between 80 and 120 parts per hundred million. It is worth considering how serious a level this is considered in medical circles.

THE internationally-accepted classification of lead poisoning is divided into four stages:

1. The person has no symptoms and the level of lead in his blood is under 40 parts per 100 million.
2. The person has been exposed to acceptable absorption. He has no symptoms and the level of lead in his blood is usually between 40 and 80 parts per 100 million.
3. The person has been exposed to excessive absorption. He is suffering from mild symptoms of lead poisoning. These include headache, dizziness, difficulty in sleeping, irritability, tiredness, constipation and anaemia. A tell-tale blue line of lead sulphide may form on his gums and he may complain of a metallic taste. This can happen when the level of lead in his blood is between 80 and 120 parts per 100 million.

The person has been exposed to dangerous absorption. He is suffering from severe symptoms of lead poisoning. These include a gripping pain in the abdomen sufficiently severe to double him up; weakness and soreness of the muscles, especially those on the back of the arms, often causing "wrist drop"; and rarely, kidney disease, and brain poisoning, producing reactions similar to those from a brain tumour. The level of lead in his blood is over 120 parts per 100 million.

The only difficulty with these categories is that some doctors argue that there are no acceptable levels of lead absorption. An experiment at the University of Manchester found that 26 apparently healthy medical students who had been exposed only to ordinary environmental lead pollution had a reduced level of an enzyme in their red blood cells. Two years ago The Sunday Times revealed that a medical team at the Middlessex

apparently healthy lead workers showed nerve abnormalities when given a special test.

Children are much more susceptible to poisoning than adults. Those chiefly affected are aged between one and three years old living in poor housing conditions. The source of poisoning is usually the eating of old paintwork which contains lead. Although the symptoms may appear mild—a vague illness or anaemia—affects can be much more severe. The poisoning of the brain may show up as lethargy, irritability, marked mental disturbances, or convulsions. Since these closely resemble those produced by a brain tumour, a needless operation can sometimes result. Figures show that up to a quarter of children with lead poisoning of the brain will probably die.

Treatment involves removing the person from the source of poisoning, injections of calcium to encourage the laying down of the lead in the patient's bones or the injection of a new chemical called versenate to remove the lead from the body altogether.

One would imagine that levels as high as specified in section four, known and reported, to the Factory Inspectorate, would bring drastic action. In its report for 1969 the Inspectorate set out for the first time what it considered to be a reasonable warning level: 80 parts per 100 million, which is about three times the level found in the average city dweller.

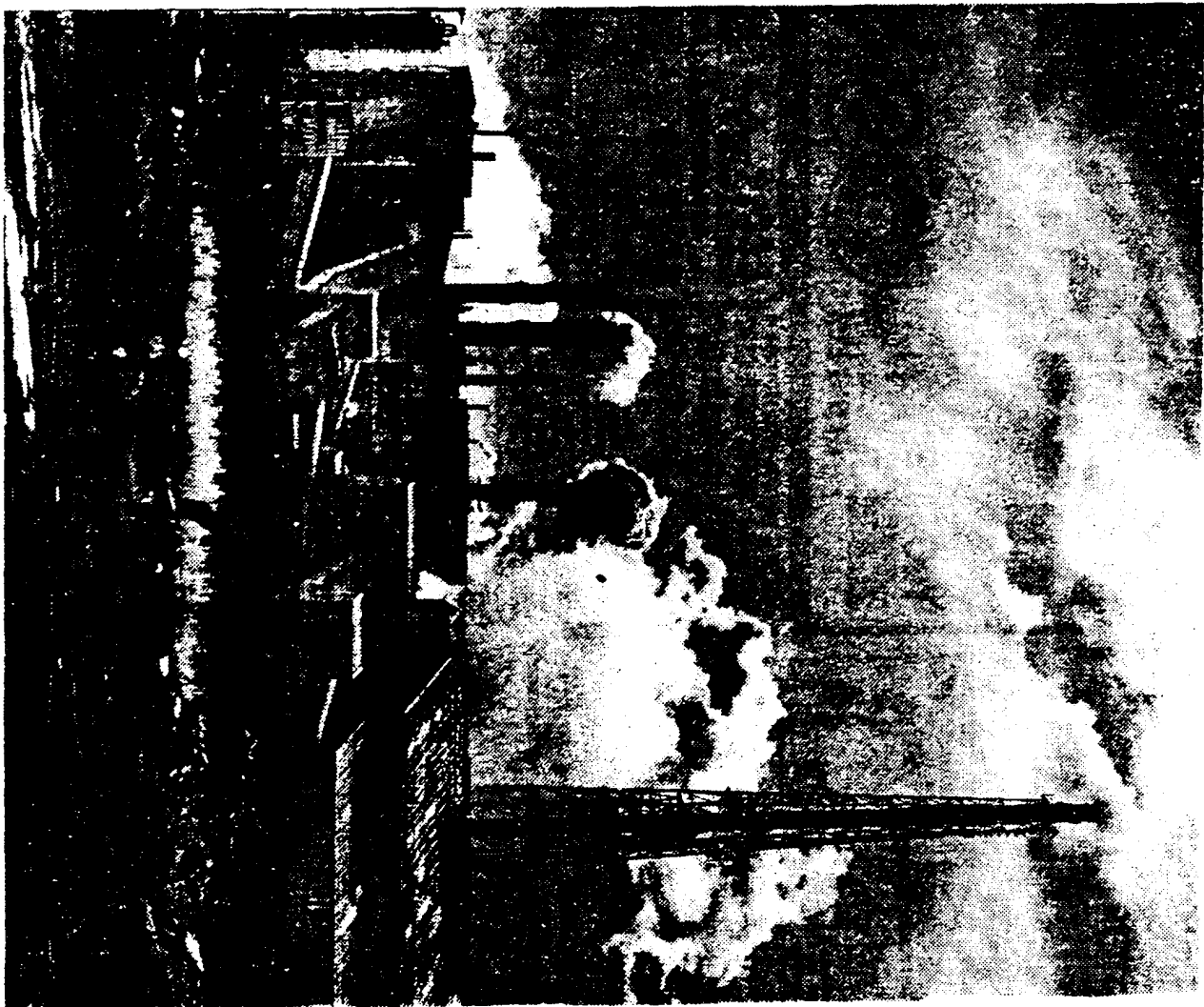
Yet this suggested level for notification carries no legal force and the attitude the Inspectorate appears to have adopted at Avonmouth is that a man with a level 120 parts per 100 million should be watched carefully, but that as long as he is taken off his job as soon as there are clinical signs of poisoning, no harm will come to him. This attitude is alarming in view of the fact that one body of medical opinion believes that brain damage

could be occurring at 80 parts per 100 million or even less.

Even more alarming is evidence that the Inspectorate is prepared to stretch its own specified limits. In 1969 it carried out a survey in the lead battery industry. About 50 per cent of the workers it examined had blood lead levels of greater than 80 parts per 100 million and 13 per cent had levels of over 125 parts—thus placing them well into clinical section four. "These results," the Inspectorate said, "indicate an urgent need for a review of the working environment in parts of this industry." Yet none of the offending firms was forced to close down.

JANUARY 30 1972

LONDON TIMES



The works at Avonmouth where men have been found to have high levels of lead in their blood

LIA-76438

Ine regulations out of date

And although Sir George Godber, the Government's medical officer to local authorities, sent an urgent request a month ago asking all local authorities with smelters in their areas to check the lead levels in the blood of people living nearby, Bristol has not yet acted because of the expensive and sophisticated equipment which is required.

The Corporation's situation is a difficult one. The Avonmouth plant provides 1,200 jobs. It pays considerable rates, and an added bonus to council coffers of £50,000 a year for partially-treated water from the Corporation's new sewage works. It is naturally not anxious to cause alarm and yet it cannot continue to delay complying with Sir George Godber's request.

OVERALL it is clear that the whole spectrum of health in the lead industry needs re-examination, and the 1911 regulations brought up to date. While quite detailed about the state of floors, washing facilities, protective clothing, and such matters, they lay down no legal limits for the amount of lead in the air, or in the bloodstream of workers. The gentleman's suggestion about the warning level of 80 parts of lead to 100 million parts of blood needs legal weight behind it and the similar suggestion that lead in the air in a factory should not exceed 200 micrograms per cubic metre needs re-thinking.

The limit in the United States is soon to be reduced to 150, and in Russia, following long term experiments with animals, the safe level now stands at 10. Tragically, history may yet show that there is no safe level.