FIG 2—Chest x ray film one week after inhalation of liquid paraffins.

mm in the first hour and leucocytes to $22.7 \times 10^9/l$ and haemoglobin concentration decreased to 10.3 g/dl.

Penicillin was changed to doxycycline and the corticosteroids were continued. Thereafter the condition of the patient improved. The fever abated slowly during the following two weeks, oxygen pressure returned to normal, and the chest x ray film showed considerable improvement of the pulmonary abnormalities. After about three weeks in hospital the patient was well enough to be discharged. At check up about two months after the accident

she had completely recovered. Chest x ray film showed almost complete disappearance of the pulmonary abnormalities.

Comment

Inhalation or aspiration of paraffin produces two types of lesion: one is acute with pneumonia caused by massive administration into the lungs, and one is chronic with fibrosis and granulomatous reaction.¹⁻³ The case described shows the acute form, which seems to be rare but easily diagnosed. The chronic type is seen in patients who use paraffins as purgatives or as nose drops. That reaction is caused by repeated aspiration or inhalation of small amounts of paraffin, is more difficult to diagnose, and should be remembered when a patient presents with unspecific nodular pulmonary changes on chest x ray examination.

Paraffins are non-corrosive and are solvents of lipids, which most probably cause the damage to the lungs in the acute form. Our patient was treated with corticosteroids, though the efficacy of this treatment is disputed.^{4,5} Penicillin did not prevent the development of the abnormalities in the lung, with leucocytosis and high fever. As the aspirated material in cases like this is sterile it might be better not to give prophylactic antibiotic treatment routinely but only if signs of secondary infection appear.

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One small slip and its consequences

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As a medical officer of health I used to find that just one or two cases of food poisoning, let alone an outbreak, were a cause for apprehension and concern. It was only in retrospect that I could regard them with the detached interest of a detective story.

But there was perhaps one exception to this generalisation. The incident began on a beautiful summer morning with two small boys who lived on a council estate on the outskirts of a borough with a population of about 60 000. The boys obtained their parents' consent to go fishing in a nearby stream, but once out of sight of the council houses they changed their minds and decided to explore the countryside. Soon they reached a fence with a "No Admission" sign. They promptly climbed through the wire and found themselves in a completely new world of large rectangular tanks separated by parapets. There was the fascinating sound of running

water; some of the tanks were full, some only partly filled; and there was a sweet but not unpleasant smell in the air. They had discovered the borough's sewage works.

They explored further, but in walking along the top of a parapet one boy lost his balance and fell into a settling tank. He regained his feet, and fortunately the water level only came up to his neck. The difficulty was that he could not reach the top of the parapet to pull himself out, and his friend looking anxiously down could not pull him out by his hands, his jersey, or his hair. It was one of those occasions when children suddenly become adults. In a hurried discussion the boys decided that the one who had fallen into the tank should stay exactly where he was, quite still, while his companion ran back to the housing estate to raise the alarm.

Not long afterwards the whole estate knew what had happened. Housewives in coloured aprons began running across the fields towards the sewage works, followed by men with ladders, ropes, and anything useful to hand. When they arrived they found that the boy was still safe where he had been left. He had not moved, and with the help of ladders and ropes he was pulled to safety. White with shock and exhaustion, he collapsed on the ground. Soon an ambulance arrived and he was taken away to the local infectious diseases hospital. Subsequent examinations showed that he had

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contracted Sonne's dysentery, but, what was of more concern, he was also excreting *Salmonella typhi*. His recovery was uneventful, but we were left with the problem that, since no case of typhoid fever had been notified, there was probably a typhoid carrier in the borough. The fact that *S typhi* could be recovered from a small percentage of samples from large sewage works did not lessen the uneasy feeling that we might have a counterpart to "typhoid Mary" somewhere in the vicinity.

Pursuing the positive cultures

In discussing the position with the director of the public health laboratory we decided that we could not turn a blind eye to the facts: we had to track the infection up the town's sewage system. This we did with the help of the public health inspector by placing the first swab at the entrance of the sewage effluent into the sewage works. The swab grew a culture of *S typhi*. Further swabs were then suspended from manholes where branch sewers entered the main sewer. The first few swabs grew positive cultures from the main sewer but negative cultures from the branch sewers. Then we reached the manholes where the swab from the main sewer was negative but that from the branch sewer was positive. We pursued the same procedure up the branch sewer, then to the minor street sewers that fed into it, until at last we had identified the street and finally the last positive culture in the street. Curiously enough, throughout this process no one took the slightest interest in our activities. Pedestrians were not concerned, the press mercifully was ignorant, and the only problem was to keep barking dogs at bay.

The last positive culture came from a manhole in a poor district, and it was served by a common drain from about eight terraced houses. Each house had its privy in a yard at the back of the building so we attached swabs to each lavatory pan and within a short while

the house whose lavatory swab provided a positive culture was identified.

That evening I called to see who was at home. Only two people were living there, a mother and her mentally handicapped son. The father had left soon after the birth of the child. It certainly was not easy to explain the position to the mother, but when I discovered that she worked as a floor cleaner in the main hospital and might be called into the kitchen if there was a staff shortage I drew out a simple chart of the town's sewage system and little by little convinced her of the risks to the public and even more to her son. She was a sad little woman whose only thought was for her handicapped child, who attended a special unit each day, so somewhat reluctantly she agreed that they should both provide specimens of stools. As we had expected, her specimen was positive and the boy's was negative.

Consultation with the general practitioner and consultant physician resulted in treatment with a whole series of drugs, but to no avail. It remained only to see if she would consent to a cholecystectomy, and after some persuasion, but still not understanding, she did agree—on condition that her son, who would be cared for in a children's home, should be allowed to visit her each day. Fortunately, the operation was successful, and all subsequent cultures of specimens from the mother and the sewers were negative. Each day the handicapped son was taken to see his mother for an emotional reunion.

Eventually, she was discharged from hospital for a well deserved convalescent holiday with her son. When they returned the boy resumed attendance at his special unit and the mother returned to her work at the hospital. The file was closed. Afterwards I used to think how strange it was that the lives of two families in the town had become linked together in this way although they had never met or known each other. But had all the investigation and upheaval been necessary? There is seldom proof in public health work, but I like to think that the effort was worth while.