Science in Europe/Smallpox Death in Britain Challenges Presumption of Laboratory Safety

Peer review failed dismally

If the World Health Organization is right in its claim that smallpox has now been eliminated from the earth, Janet Parker, a 40-year-old medical photographer at the Medical School at Birmingham University, will have the unenviable distinction of having been its very last victim.

But unlike most of those countless millions killed by smallpox over the course of human existence, Janet Parker's death is likely to rate as more than a mere statistic. It has become a cause célèbre in Britain, focusing attention on the safety standards in biology laboratories and the way those standards are enforced. More immediately, it caused the suicide of a distinguished biologist and provides the substance of a court action against Birmingham University, yet to be heard. Its reverberations will take a long time to die down.

Janet Parker contracted smallpox, it seems safe to say, from a laboratory situated on the floor below her darkroom in the university medical school. It was a laboratory run by Henry Bedson, and its days were numbered. With the successful eradication of smallpox almost complete, laboratories specializing in smallpox research were closing, and Bedson's was due to close at the end of 1978. But Bedson was understandably determined to complete his research before the end of the year, and pressed ahead. His laboratory failed to meet almost every test that is applied to the handling of dangerous pathogens in research laboratories; yet in the last year of its operations, work there increased tenfold. The victim of that haste was Janet Parker.

The circumstances in which she contracted the disease are known in unusual detail, thanks to an investigation carried out by Reginald Shooter for the Department of Health and Social Security. Shooter's report was leaked to the press by Clive Jenkins, the general secretary of the trade union to which Mrs. Parker belonged.

Shooter's report is one of the most damning documents ever produced by an official enquiry in Britain. It shows that Mrs. Parker probably came into contact with the smallpox virus while making telephone calls from a disused office next to her darkroom. This office was linked to Bedson's animal pox room below by a service duct, with access to the duct on each floor provided by inspection panels. On both floors the panels were loose, and tests showed that a virus released in the animal pox room could find its way through the duct into the telephone room above. Off the animal pox room was a smaller laboratory in which the smallpox research was conducted. A safety cabinet equipped with an extraction fan was supposed to prevent the smallpox virus from escaping into the animal pox room next door, but tests again showed that it was unable to do so in all conditions. Shooter's thesis is therefore that the virus escaped from the smallpox room into the animal pox room and from there through the service duct into the office above. On 25 July 1978 Janet Parker spent much of the day on the telephone, ordering photographic equipment from suppliers before the end of the department's financial year on 31 July.

Below, work was proceeding with a strain of the smallpox virus Bedson had obtained from the laboratory at St. Mary's Hospital Medical School in London. It was a strain first isolated from a 3-year-old boy in Pakistan in 1970 and named, after him, Abid. It was this strain which was subsequently identified in fluid from Mrs. Parker's body, making it clear beyond question that she had been infected by a virus from the laboratory. The "outbreak" claimed only one other victim; Bedson, who killed himself by cutting his throat in his study 5 days before Janet Parker died.

The events at Birmingham were a tragedy on many levels: to the families involved, to the university and, just possibly, to the scientific system itself. For what the Shooter report demonstrates is that peer review, when applied to health and safety in the laboratory, failed dismally. The relaxed and informal relationship between equals, in which outside bodies were not allowed to interfere, did not produce a safe laboratory. On the contrary, the system appears to have connived at breaches of the most elementary kind in laboratory security simply because Bedson was a well-known figure, a member of most of the relevant committees, and a man too senior to be told he was breaking the rules.

At least three levels of monitoring and inspection failed at Birmingham. First there was the responsibility of the university itself to ensure that the smallpox laboratory was safe. That responsibility was effectively delegated to Bedson, who acted as his own safety officer. Nor, it appears, did he spend very much time in the smallpox laboratory itself.

The second tier of responsibility was the national one. Nominally, control of the most dangerous pathogens was the responsibility of a committee called the Dangerous Pathogens Advisory Group (DPAG), established in 1975. Its chairman was Shooter, and Bedson was himself a member. It met for the first time in November 1975, and in August 1976, after its inspector had visited Bedson's laboratory, it advised the Department of Health and Social Security that the laboratory was suitable to continue work with smallpox.

Yet in October of the same year, DPAG published a safety code for laboratories handling pathogens which illustrated how deficient Bedson's laboratory really was. The report suggested that laboratories should have an air lock, a shower, a double-doored autoclave for sterilizing materials used in smallpox work, and proper changing facilities. Bedson's laboratory had none of these, yet the DPAG inspector, R. J. Henderson, reported that precautions appeared to be very thorough. On his arrival he was vaccinated against smallpox by Bedson, a procedure which should have been standard for all those working in the medical school buildings but which had been overlooked in the case of Janet Parker.

It now seems extraordinary that Bedson should put his name to a report which outlined standards he knew his own laboratory did not reach. It also seems extraordinary that Henderson, while noting the failings of the laboratory, should nevertheless recommend that it be allowed to continue work with smallpox. The explanation is this: DPAG was allowed to exercise discretion "in advising departments . . . if it were satisfied that the ends which the code sought to achieve were fully met by other means." Thus the DPAG set up a code which it had the discretion to ignore.

In the case of the Birmingham laboratory, the grounds given by Henderson for exercising that discretion were five. First, he said Bedson was a virologist of considerable repute, an experienced and

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very conscientious worker. Second, the vaccination program was "most thorough." Third, the smallpox work was never delegated, but always done by Bedson or his two assistants. Fourth, "the drill for not allowing escape of the virus is thorough and more than makes up for the lack of a shower and changing facilities," and fifth, "the laboratory serves a large and important area in which there are a very large number of immigrants with a continual flow to and from tropical and sub-tropical parts of the world."

In the light of hindsight, these justifications make hollow reading and in at least two cases were manifestly untrue. The Shooter report comments: "It is now clear that the inspection report on the Birmingham smallpox laboratory did not provide enough information for DPAG to obtain a full picture of the laboratory, and not enough questions were asked about the actual working of the laboratory." Thus Shooter found himself in the curious position of criticizing his own committee.

The final level of responsibility, and the only one which came close to doing its job properly, was that of the World Health Organization. As smallpox was gradually conquered through vaccination campaigns, the WHO moved toward limiting the number of laboratories working on it to a few "Collaborating Centres." In September 1977 WHO told Bedson that his laboratory was not to be one of these centers, and the following month it was agreed that the laboratory should close at the end of 1978. That gave Bedson just over a year to complete his research.

Then, in May 1978, a three-man WHO team arrived to inspect Bedson's laboratory. Bedson had been told by J. G. Breman of the WHO Smallpox Eradication Unit that the visit would be "very informal." Nevertheless, Breman went on, "it is important that each laboratory be visited to assure that the directors understand the wishes of WHO and our advisory group regarding safety in laboratories containing variola (smallpox) virus." Bedson wrote to WHO before the inspection, admitting that "our facilities in no way match those set out for the definitive smallpox labs. . . . It would be expensive and very costly in time if we were to try and establish such a laboratory and quite unjustified in view of our projected halt to the smallpox/whitepox work at the end of the year. I hope the visiting group will accept that this is a reasonable approach."

In fact, the group was far from satisfied. It expressed considerable reservations and said that the physical facilities clearly did not meet the WHO recommendations. One member of the group, J. H. Richardson, director of the Office of Biosafety at the Center for Disease Control in Atlanta, Georgia, went even further. Bedson's actions to upgrade the containment capability of his laboratory had been "minimal," Richardson said, "The laboratory falls short of the WHO standard and should be upgraded to meet the standard or discontinue work with variola at the earliest possible date."

The letter passing on Richardson's comments to Bedson was dated 1 August, and by then it was too late; Janet Parker had already caught smallpox, although it had not yet been diagnosed. On 24 August Bedson replied to WHO, saying that he would be giving further thought "to anything we can do to improve our safety procedures," but adding, "As you know, there is no question of our being able to upgrade our facilities to meet the full WHO standards." The very same day, after sending the letter, Bedson examined some pus from pock marks on Janet Parker's body and diagnosed smallpox. Within 3 weeks both she and Bedson were dead.

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The case has attracted huge interest, not least because the Shooter report concludes that an earlier outbreak of smallpox in Birmingham in 1966 originated from the same source. The first patient in that outbreak, which affected 73 people and may have contributed to the death of one of them, was a photographer doing exactly the same job as Mrs. Parker. At the time, smallpox was still a comparatively common condition and the outbreak was never definitively traced to the university. There now seems little doubt, however, that it was the source.

The publication of the report was stage-managed with masterly skill by Clive Jenkins, general secretary of the Association of Scientific, Technical and Managerial Staffs (ASTMS), the union to which Janet Parker had belonged.

But relations between ASTMS and the universities have always been prickly, those with Birmingham University particularly so. Soon after Mrs. Parker's death, Jenkins issued a statement suggesting that she had not died of smallpox, but that there might have been unauthorized experimentation at Birmingham with other dangerous pathogens, or with recombinant techniques. The statement was reported by *New Scientist* and on BBC radio, despite its scientific implausibility, and the university responded with a lengthy and bad-tempered statement denying it. "Offensive, unscrupulous, and unfounded" were three of the adjectives the university used in one of the most vitriolic press releases experienced reporters can ever remember a British university issuing.

Thus was the stage set for the Shooter report, which was passed to Jenkins by the Secretary of State for Social Security, David Ennals, together with a covering letter from his private secretary saying that it was a "pre-publication" copy of the report "for your information and use." The letter explained that the report could not be published before the prosecution being brought against Birmingham University by the Health and Safety Commission, for fear that it might prejudice the case. But the copy was not marked confidential; ASTMS photocopied it and issued it to the press.

Birmingham University has so far made no comment on the contents of the report, except to make a successful application in court to seek a High Court order preventing the Birmingham magistrates from hearing the case brought against the university by the Health and Safety Commission. The hearing was due to take place on 26 January, but the university argues that the release of the Shooter report was a contempt of court which could prejudice the defense. It will now be up to the High Court to determine whether the hearing should go ahead, be delayed, or take place somewhere else.

Whatever the legal outcome, it seems likely that the Health and Safety Commission will in the future play a much greater role in the control and monitoring of universities. Many scientists will regret the change, which will bring an outside body into the operations of academic institutions and disrupt the older, cosier style in which the scientists were their own policemen. But in the light of what happened at Birmingham, producing a defense against the imposition of outside standards on universities is likely to prove difficult.—NIGEL HAWKES

Nigel Hawkes, who reports "Science in Europe," *is science correspondent for* The Observer *in London.*