

Technical Note: The Dangers of Fumigation of Archives with Ethylene Oxide

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After the Darwin cyclone and Brisbane floods of 1974, it became apparent that the Australian Archives was insufficiently prepared to handle a large mass of wet or mould affected records.¹ In both cases agencies had turned to Archives for assistance and although considerable help was given, facilities available at that time were far from adequate.

Largely as a consequence of these experiences, it was decided to install an airing room for wet records and an ethylene oxide fumigation chamber, with provision for a drying cycle, at the Villawood Repository in New South Wales. The idea of having an airing room installed in conjunction with a fumigation chamber was that of Neville Corbett, at that time Regional Conservator at Villawood.²

Ethylene oxide was chosen as the fumigant for a number of reasons. It was known that it was widely used by other archival institutions and it was recommended by the American fumigation engineering company from whom we had initially considered buying the chamber (as it turned out the chamber was actually made in Australia). A mixture of 10% ethylene oxide/90% carbon dioxide was found to be the most stable, cost-effective combination. In addition, it was also less toxic and still quite effective against mould spores. Some institutions in Australia now fumigating/sterilizing with ethylene oxide are using far too high a concentration of gas which has the potential of being explosive.

Throughout all stages of the planning of the fumigation chamber, Neville Corbett has carried out extensive investigations into the safety and effectiveness of ethylene oxide. Contact has been made with a number of institutions for advice, for example, C.S.I.R.O., the New South Wales Health Commission, the Atomic Energy Commission and Commonwealth Industrial Gases Limited. This has been in liaison with the Commonwealth Department of Housing and Construction which is

responsible for the construction and commissioning of the fumigation chamber prior to handover.

The need for such investigations was reinforced on 29 July 1977, when ethylene oxide was gazetted as a noxious gas or 'dangerous substance' for the purposes of Part VIIA of the (New South Wales) Public Health Act 1902 and Regulations.

Further research on the safety aspects of fumigation has been conducted by the School of Public Health and Tropical Medicine at the University of Sydney. It has shown that ethylene oxide requires far greater care in its general use than has hitherto been appreciated, and that the threshold limit of human exposure to the gas must be strictly monitored and controlled.

This has led to very detailed instruction procedures, including a 'Work Permit' system, being drawn up by the School of Public Health and Tropical Medicine. Recognition should be made here of the magnificent work which has been done by Messrs Alan Rogers and Christian Dupressoir, occupational hygienists. The urgency with which their procedures were compiled was reinforced when a Swedish research team recently published a report stating that there may be a link between ethylene oxide and leukaemia. We were informed of this on 21 September 1979, by the suppliers of ethylene oxide, C.I.G. Limited.

It must however be emphasized that the School's procedures apply *only* to the fumigation chamber at Villawood. Australian Archives now has fumigation chambers in Sydney, Perth and Brisbane. However, until all safety aspects of the Perth and Brisbane chambers can be checked by the School, and approved operating procedures drawn up for each installation, they will not be used.

The purpose of this technical note is to alert archivists, librarians and members of other institutions using ethylene oxide, to the potential dangers inherent in the improper use of ethylene oxide. Investigations are still not complete, but it is obvious that much more care must be taken over both the design and use of fumigation chambers than has been taken in the past. Exposure to ethylene oxide does present a health problem, and expert advice should be sought before and during the installation and use of a chamber.

The liaison work between Australian Archives and the School of Public Health and Tropical Medicine was done originally by Neville Corbett. More recently, Deborah Keane of the N.S.W. Regional Office of the Australian Archives has taken over this role. Enquiries on this matter should be made to the Director, Australian Archives, P.O. Box 34. Dickson, A.C.T.

FOOTNOTES

1. N.J. Corbett, 'Damage to records in Darwin caused by Cyclone Tracy', *Archives and Manuscripts*, Vol. 6, No. 3, May 1975.
2. T. Walsh and N. Corbett, 'Fumigation Chamber and Airing Room Complex at Villawood', *Archives and Manuscripts*, Vol. 6, No. 8, February 1977.