

concern or worry on the part of those in the field of malignancy research.

● (1540)

He further surveyed the Toronto area. He talked to other specialists who come under the term of respirologists. None of these people had any cases referred to them that could be considered in any way related to insulation. These specialists trained in this field have the equipment, the expertise and the sophisticated support to pick up early changes. Out of a population of approximately 2.5 million people, I think a lack of problems is most significant. That type of information is necessary so as to decide what to do. This doctor has been looking for the particular disability created by formaldehyde insulation. He was not able to find it, and he is continuing his search.

The next question is how toxic is formaldehyde? At this moment in practically every hospital in the country there are doctors and technicians working with formaldehyde. I am referring to pathologists and their technicians. Pathologists deal with diseased organs. The diagnoses they make frequently lead to the form of treatment that will follow. If they decide a lump in the breast is malignant, they may recommend partial amputation of that breast. If they identify tumor cells in a lung it usually means partial removal of the lung. In the course of the pathologist's work, the tissue submitted to him, whether from a surgical operation or from an autopsy, is put into Formalin. Formalin is usually a 40 per cent solution which for the most part is diluted into a 10 per cent solution. Tissues are kept in containers filled with this solution. Every day doctors remove tissues from the containers. For an hour to two and a half hours every day, with the emanation of fumes they cut up the tissues and prepare them for slides. Tissues are stained for study microscopically. For two to three hours every day of their working lives the pathologists and their technicians are exposed to high concentrations of formaldehyde.

What effect has this had on the pathologists and their technicians? In the British Isles a study was carried out on 15,000 of them. The following questions were asked and analysed. Is there a high incidence of cancer in that group compared to doctors working in other fields and compared to the general population? No excess of cancer cases was found in that particular group. Second, do they have any extra respiratory conditions, such as frequency of colds or irritated sinuses? Again, there was no suggestion that this group had any greater number of respiratory infections or diseases compared to the average population and to other doctors. What about longevity? The record showed that this group of people lived longer than the average.

The answers to these questions and this study are not 100 per cent proof that there are no ill-effects from formaldehyde. But certainly a study of 15,000 people working in this type of environment over a number of years and showing no ill-effects—certainly not the effects so widely publicized—must make one think in terms of what is the effect of prolonged

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exposure to conditions where there is a high concentration of formaldehyde.

Why, then, are we so concerned? Why has this epidemic of fear been visited upon us? A number of factors can be considered, but probably at the back of it all has been some experimental work which has been done in the United States by a doctor in the Chemical Industry Institute of Toxicology in North Carolina. This doctor studied 2,000 rats and mice. The animals were subjected to various levels of formaldehyde six hours a day, five days a week for up to two years. Of this group only the rats developed nasal cancer. The number was significant. The experiment was done on a threshold level; that is, the animals were exposed to a certain percentage of formaldehyde. If the formaldehyde concentration was below a certain level, a lesser incidence of nasal cancer was noted. This experimental study was done by an honest researcher and showed that cancer can occur in the nasal lining of mice if they are exposed to a much higher concentration of formaldehyde than is ever found in a normal setting.

This type of cancer can occur in animals and it has some very special characteristics. These characteristics relate to the breathing mechanism of the rat. A young mouse given a pungent or an irritating odour will stop breathing, or its breathing mechanism will diminish. On the other hand, a rat hyperventilates, which means that it breathes more rapidly and in doing so a mechanism comes into play causing considerable irritation of the lining mucosa of the nose. There is an explanation for it. However, it is difficult to say whether this is due to formaldehyde specifically or whether it is due to the irritation of increased breathing of any irritant.

But what correlation is there? Can one extrapolate the findings in animals to human beings? This question has been considered for many years. It has been debated in various scientific circles. The conclusion is that there is very little correlation or linkage between what is found in animals and what is found in human beings as far as the production of cancer is concerned. The American policy is that if some substance produces cancer in an animal over a fixed period, it is decided as a policy that the particular substance will be banned until it can be proven that it will not produce a similar condition in human beings.

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During the past three to four years various studies have been conducted. One was conducted in Denmark, one in England to which I have alluded, and three in the United States. They concerned the effects on people working in an environment where there is a high concentration of formaldehyde. In none of them was it possible to find excessive cancer of any kind in the average population, nor was there any particular evidence of nasal cancer. Based upon medical evidence as a result of the work of accepted research workers, there was no direct evidence that human beings exposed to large doses of formaldehyde developed mucosa cancer.

These were not well-controlled experiments. Most human experiments cannot be properly controlled and cannot be taken