

Housing and Health

During the second National congress of the French Society of Aerobiology, « Housing and Health », the problems exclusive to air pollution were approached by a large interdisciplinary group with four major themes : Materials, Analysis and sampling methods, Buildings and closed systems, Collective and individual habitats.

With regard to asbestos materials and the health risks involved in indoor exposure to mineral fibers it has been shown that asbestos pollution can be caused by the erosion and damage of such materials. Risks levels are those above $50\mu\text{g}/\text{m}^3$, that is to say $25\text{f}/1$ ($5\mu\text{m}$ of length). At amounts above these levels, it is necessary to initiate special fittings and even to remove the materials. The use of asbestos for spraying in buildings has been forbidden since 1978 but this prohibition does not solve the problem posed by the existing insulation materials containing sprayed asbestos, which are now several decades old and, in some cases, entering a phase of deterioration.

During the past years, the emission of formaldehyde vapours within UFF insulated homes has been held responsible for health problems. It seems, however, that the unpleasant effects of formaldehyde do not have the degree of severity reported.

On the other hand, the necessity to preserve wood which obliges the relevant industries to use active chemical substances, also requires that particular attention must be paid to the potential risks represented by the substances themselves and the fixation of preservatives in the wood.

Thermal damage to materials produces noxious effects, not only as a result of the high temperature, but also by the toxicity of the substances released. Natural materials, but also particularly synthetic materials, are particularly liable to this.

When undertaking risk assessment and regulation, the potential toxicity of materials, the probability of exposure and the seriousness of the effects must all be known. With this aim in view, laboratory models are necessary.

Work undertaken inside the house plays a great part in indoor air pollution. Chemicals or other materials dispersed in the air in the form of vapours and particles are capable of penetrating to the lower respiratory tract and producing ill effects. These risks can not be ignored for two main reasons : The ever increasing number of handymen and also the growth of the do it yourself market. Anybody can obtain products or equipment which, until recently were reserved for professionals. Prevention is inadequate for ignorant uses without medical surveillance.

With regard to materials, the setting up of the 1993 simple market within the European community requires an elaboration of the documents for the individual member states. As for « Construction products », a directive was passed in this respect on December 21, 1988. This defines the essential requirements applicable to both building and civil engineering works. However, it is difficult to deal with other aspects such as air quality, emission of pollutants or radiation, because of an almost total absence of regulations at the present time.

The quality of the air inside houses may be changed as a result of several sources of pollution : combustion, equipment, furnishing materials, tobacco smoke, household products ... and the influence of the external surrounding air.

Air quality inside homes in the Paris region was evaluated by measuring several atmospheric pollutants. In these homes, the interior emission of ammonia and volatile organic compounds was obvious with regard to other pollutions such as sulphur dioxide, nitrogen dioxide, particles, polycyclic aromatic hydrocarbons and metals, the influence of the external surrounding air remained predominant.

When compared with the effects of tobacco or of living conditions near industrial or mining areas, the action of radon gas inside the house does not seem of any great importance even for smokers.

Studying indoor air quality is difficult. As a matter of fact, no one type of sampler and essay method exists, and many factors influence the results. An experimental test chamber has been designed (Électricité de France). It will help to provide some answers concerning the interesting questions of the emission of pollutants and the standardization of measurement techniques.

Illnesses resulting from air conditioning minor or serious, allergic or not, reveal the faulty working of ventilation systems : bad conception, bad adaptation, bad maintenance. Ventilation systems must stand up to many requirements : air transport, discharge of combustion gases smoke propagation in case of fire, noise propagation. An air conditioning system must be well designed, well built and well maintained.

In closed air conditioning systems, microbiological contamination is carried by the occupants, humidifiers, surfaces, cooling towers and condensers. This contamination by bacteria, fungi, amoeba, legionellas ... can induce serious infections, particularly in immunodeficient individuals in hospitals. Several types of preventative measures must be taken : regular inspection and decontamination of the air conditioning system, control of the environment, and control of stagnant water.

The consequences of passive smoking on health, particularly for the young child have been clearly demonstrated.

Various household products also involve air pollution. A national database relating to the consumption of these products is available in France (CEA). The risks resulting from the use of consumer home products were investigated and VOC emission rates, in particular, were obtained.

Allergens such as dust mites, moulds and pet epithelia also influence the air quality of houses. The relationship between dampness and the development of mites is well known as is the relation between levels of dampness in housing and allergic disorders. The avoidance of such allergens is of primary importance : sunning, ventilation, a lower humidity level and anti mite products may help to fight against dust mites. An easy test (Acarextest) exists for evaluating their presence.

Children can suffer from broncho-pulmonary diseases caused by air pollution resulting from gas and or smoke production, and microbiological contamination resulting from defective health conditions.

In France, the problem of the control of air pollution inside inhabited buildings is seen as a matter of priority. Indoor physical conditions ensuring comfortable, safe and healthier buildings are the object of research in which all those participating in building and the users of the buildings are concerned.

In 1988 and 1989, research groups on « indoor air pollutants » and « comfort and health in buildings » were launched jointly by the Planing Constructors and Architects, the Secretary of State for the Environment and the Ministry of Health.

On the theme of materials and building products, they underline the requirement of environmental security, health and comfort should take a major place in the development of the great European market of 1993.

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