THE PROBLEM OF AIR POLLUTION IN THE NETHERLANDS AND SOME CONSIDERATIONS REGARDING NORMS FOR AIR POLLUTION

by

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It is now recognized that the atmosphere in the urban and industrialized areas of The Netherlands is polluted by the by-products of urban activity, and by traffic. The problem was indeed already recognized in the decades before the War, but was not considered then to be of great importance, though interest in abating the nuisance of fly-ash and soot, as well as in eliminating industrial dusts and gases, resulted in unofficial recommendations regarding the height of industrial chimneys.

It is interesting to note that a professor of social hygiene emphatically stated in 1957 that the problem of smogs and their influence on human health did not exist in The Netherlands. However, in the same year the first review of the health effects was published in a Netherlands journal, and since then interest in this subject has grown.

Before the War complaints had been registered in some localities regarding dust and fly-ash, sometimes bad odours. Since the War the many data collected in other industrial countries, especially the United Kingdom, have aroused interest in the influence of air pollution on human health. In addition, the ill effects on plant life, particularly with regard to horticulture, on property and the landscape in general, came to be considered more and more as a major problem. The end of the second phase of industrialization initiated since the War cannot yet be foreseen, though it is certain that conditions in The Netherlands - the flat terrain, the relatively strong winds and the better technical provisions of industries started since the War - do not favour the occurrence of heavy smogs.
Considerations regarding health aspects

The importance of fresh air as a primordial condition for health is now understood by the public, the local authorities and the government, and present-day thinking on integrated health and well-being gives a new impetus and strong support to the implementation of remedial and preventive measures. It is true that the biological adaptation of the human organism to all kinds of environmental conditions is great, but it is certain too that human resilience is not inexhaustible.

During periods of heavy fog, which at least in the Western part of the country occur no less frequently than, for instance, in England, the amounts of measurable pollutants increase, and the general level of SO\textsubscript{2} in the atmosphere of certain areas has risen. Awareness of the potential dangers has resulted in more research on the composition of the air, gradients of air pollution levels, local meteorological conditions and in epidemiological studies concerning the influence on human health. There are indications that during periods of heavy smog, morbidity and mortality increase.

It is now generally understood that integrated planning for future urban and industrial environments has to be based on more exact studies of all aspects of urbanization and industrialization on the health of the population. People are no longer willing to endure air pollution, especially bad odours and dust, and the importance of air pollution control as part of the government's public health responsibility is indicated by the law recently enacted to establish an air pollution control council under the Ministry of Social Affairs and Public Health.

In the meantime, the Organization for Applied Scientific Research in The Netherlands (TNO) had set up a standing committee on which all interests were represented. The health aspects, as a basis for practical norms, receive more and more attention. The results of preliminary studies made during fog episodes, especially data on morbidity and mortality, do not exclude a possible correlation between the fluctuations in air pollution (as measured by the volumetric method for SO\textsubscript{2} and black suspended matter) and health.

In 1960 a survey was carried out in the mining area of South Limburg adjacent to the mining area of Belgian Limburg and Germany. During that period regular measurements were made of certain components of air pollution, and during one
week of each month records were kept of all patients who visited the local general practitioners. Although the differences in morbidity patterns between the quarters of the urban district did not justify definite conclusions, the survey provided us with data which might serve as a basis for more comprehensive investigations in other areas where there is considerable air pollution.

There is a need for maximum allowable concentrations for the ambient air. However, it is difficult and it may even be dangerous to set up norms before we know more about the composition of the air in urban areas, the inter-action of the different compounds and the effects in the long run on human health. Much thought has recently been given to the scientific background of norms: the collection of objective data on physiological functions under different conditions is needed before standards can be established for certain components in the air. In fact, there is a need for long-term studies on the responses of the total intact organism (healthy organism) to all environmental factors, especially those introduced by technology. Such studies have rarely been carried out and it is contemplated to initiate such studies in the Netherlands.

NORMS FOR AIR POLLUTION

Thinking on norms as applied in the USA

When we consider the necessity for establishing norms for air pollution, reference is usually made to the so-called industrial MAC values. Particularly in the USA, where these are sometimes called "threshold limit values", much has been published on the many gases, aerosols and dusts which can be produced during industrial processes. It has not been easy to apply these industrial values to the ambient air, but our point of departure has been as follows: it is certain that pure air for the population has to be ensured; it is desirable to maintain the economic advantages obtained through all kinds of industrial activity; on the other hand it is desirable to reduce the cost of ill-health; therefore the keener we are about pure air, the more we have to invest in preventive (technical and planning) measures.

It is obvious that the solution will be influenced by economic considerations too, though the deleterious effects on animals, on vegetation and on inanimate material have been given great attention, not solely for economic reasons, but also because the population, living in and seeking open-air recreation around
industrial urban areas, is becoming more and more aware of the need for clean air in the environment.

This approach, directed at a compromise, could be called a pragmatic approach.

**Norms established in the USSR**

More attention has recently been given by public health workers in the Western European countries to the approach advocated by workers in the USSR, which we might call the dogmatic approach. Here the aim is not to try to reach a compromise, but to establish absolute hygienic norms.

All people have to inhale the ambient air and they are therefore forced to take in all the substances contained in it. Based on elaborate studies concerning the functions of the central nervous system, the conclusion reached is that the concentrations of pollutants permitted should produce no direct or indirect effect on the normal physiology of the human being, including his feeling of well-being and his mood.

The practical result of the USSR viewpoint is that the maximum allowable concentrations for short-term exposure are much lower than the original MAC values used in the USA. However, according to a recent publication (Technical Report of California Standards for Ambient Air Quality and Motor Vehicle Exhaust) the adverse level for $SO_2$ (0.3 ppm = 800 µg/m³ during 8 hours) is not much higher than the maximum peak value mentioned by the USSR Committee for the Medical Supervision of Air Pollution (0.2 ppm = 500 µg/m³).

Great importance is given in the Soviet approach to sensory physiology and the establishment of a lower factometric threshold, though a concentration below the sensory level may have a reflex-producing effect by stimulation or inhibition of parts of the central nervous system. Even if such concentrations cannot be called toxic in the usual sense, they are, according to the Soviet workers, unacceptable.