

The health consequences of air pollution

by DR. JOHN S. GILBODY

AIR pollution has been in the news a lot recently — particularly as regards its contribution to the increasing incidence of asthma. Undoubtedly, much of the problem has resulted from uncharacteristically hot weather, which, indeed, prompted the environment minister to ask motorists to leave their cars at home. Nevertheless, the question remains — how serious a health problem is air pollution, and what can be done about it?

In Britain, the harmful nature of air pollution has been well known since 1952, when 4,000 excess deaths occurred during the London smog of that year. This led to the Clean Air Act of 1957, which greatly improved the situation, so much so that the Clean Air Council was abolished in 1979, as was the Medical Research Council's Air Pollution Unit a year later. In more recent times, the smogs of Los Angeles, Mexico City, Athens and Tokyo have drawn public attention to the dangers of air pollution.

So what is air pollution? Originally, pollution was made up principally of smoke and sulphur dioxide produced by the burning of coal, although nowadays vehicle combustion of petrol and diesel is the main culprit. Vehicle exhausts contain nitrogen dioxide, carbon monoxide, hydrocarbons, particulate matter and lead, and on hot days these accumulate over cities and undergo reactions catalysed by sunlight to produce ozone and acidic aerosols.

The health effects of this pollutant cocktail are difficult to disentangle, although it is well known that lead can impair the neuropsychological development of children. The health effects of nitrogen dioxide are less certain, although an episode of severe nitrogen dioxide pollution in London in 1991 was associated with a small increase in overall death rate. Ironically, while CFCs have been reducing the amount of ozone high in the atmosphere, close to earth the amount of ozone is actually increasing, and ozone is known to increase bronchial responsiveness, and worsen lung function. This could well have contributed to the recent resurgence

of asthma seen in our cities, although the picture is far from clear, as evidence is limited, and the causes are not only unknown, but likely to be multifactorial.

Moving on to other pollutants, the levels of carbon monoxide exposure seen in heavy traffic can impair the exercise tolerance of people with heart disease, and American studies of particulate matter have found that overall death rates show a small but consistent increase with particulate concentration. Particulates are the main pollutants emitted by diesel engines, which suggests that recent media proposals that diesel is more environmentally friendly than petrol may be somewhat misguided!

So what does all this data mean? What do the experts think? The increased public and media interest in air pollution in Britain in the last five years has resulted in a plethora of expert groups, the most influential of which is the Royal Commission on Environmental Pollution. The general consensus of these wide-ranging groups seems to be that, while Britain does not have a crisis on the order of magnitude of that seen in 1952, air pollution is an important health issue, and action is needed. The bottomline is that present levels of pollution do have detrimental effects on health, and more monitoring and research into the effects of the different pollutants are crucial.

How can air quality be improved? Clearly, there is no easy answer, except to say that a much greater commitment to improvement is needed by both individuals and local and national authorities. The recent Environment Act gave local authorities additional powers (but no more money) to clean up the environment, and the previous secretary of state for transport announced himself as the 'green minister'. There are also signs that the Department of Transport is beginning to take environmental issues seriously.

So what can be done to curb the hazards of the internal combustion engine? Engines can be made more efficient so that they pollute as little as possible, and this is being done. In addition, the cost and quality of public transport can be improved, which is probably the most neglected factor in our 'car and oil' economy — the biggest industries of Britain and other Western countries re, not surprisingly, oil- and car-related. Measures to encourage safe walking and cycling may also help, as many ideas such as car sharing, which by itself could halve the number of vehicles on the road. Perhaps the most exciting option, however, is the switch from the internal combustion engine to the electric engines. Many such vehicles have appeared on television recently — Peugeot and Ford seem to lead the field — and milk floats they are definitely not. Top speeds of well over 70 m.p.h. are typical, as are rapid rates of acceleration, and — most appealingly — 'overnight charge' costs of just 20p, which should be more than sufficient to see one through a typical day's driving . . .

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