

Air Pollution: Proceedings of the 1st European Congress on the Influence of Air Pollution on Plants and Animals, Wageningen, 1968. Wageningen Centre for Agricultural Publishing and Documentation Holland (1969).

THE BOOK is a collection of papers presented at a conference held in Wageningen in 1968. The papers are in English, French and German, with adequate summaries of each paper in all three languages. Most of the contributions are concerned with the effects of pollutants, and especially sulphur dioxide (SO_2) and fluorine compounds (F), upon plants, for long-term exposure to either at concentrations lower than 0.02 ppm in air may prove detrimental. An estimated 300,000 hectare of coniferous forests were affected by such pollution in 1967, trees in regions near aluminium and certain other factories being prone to damage. In Valais, France, foliage of trees near aluminium works sometimes contained up to 600 ppm of F, especially in areas treated with fertilizers. Nearby trees, untreated with fertilizers, were undamaged and contained only 30 ppm F; the reason for this interaction of fluoride and fertilizer remains unexplained. Another author reported that the F content of foliage of five species of trees is roughly correlated with visible necrosis and with distance and direction from the factory. Some aluminium works emit up to 30 kg F/hr; pine forests 32 km from the factories have shown signs of damage. Many ornamental monocotyledons are particularly F-sensitive, the type of injury varying with the genus. In *Pisum sativum*, symptoms of poisoning include withering associated with changes in the rate of water uptake and loss.

Plants adsorb SO_2 roughly in proportion to the environmental concentration. In the presence of light, SO_2 damages plants more than in darkness and some of the sulphur is evolved as H_2S . Some epiphytic Bryophytes appear to achieve resistance to SO_2 (at 5 ppm) by converting it to sulphate. The species differences in sensitivity can be used as an indication of the level of pollution by plotting vegetation maps. For example, mapping the distribution of *Grimmia pulvinata* around the Newcastle coalfield shows the existence of an 'epiphyte desert' of about 500 miles². Other papers show how various 'indicator plants' with different reactions to SO_2 and F can be used to distinguish between these two pollutants.

Photochemical reactions leading to pollution by peroxyacyl nitrates (PANs), ozone and NO_2 have been noted in several regions and the different phytotoxic effects of these agents are described by one author. Young pinto beans have been used to distinguish between pollution by PANs and ozone. Another author reported that the tar oil constituents acridine, anthracene and fluoranthene caused greatest damage to plants exposed to sunlight, the damage being reduced by antioxidants such as the fungicide maneb.

Fewer than 40 of the 405 pages are devoted to the effects of polluted air on animals, their fodder and animal-derived foodstuffs. Nevertheless, useful articles stress the importance of fluorosis in livestock near certain factories, the F content of pastures and the serious increase in the F content of cow's milk in such areas. It is, however, disturbing to note that only three papers consider effects of heavy metals, and only one of these deals with the most disturbing and recalcitrant problem of all—the emission of lead compounds in the exhaust of motor vehicles. This First Air Pollution Conference represents a milestone in 'anti-pollution thinking' and it is particularly appropriate that it should have preceded European Conservation Year. It is to be hoped that future Conferences will deal more adequately with direct and indirect pollution of animals and their foods—especially with dangerous, cumulative and neurotoxic heavy metals such as lead, mercury and cadmium.

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