M I S C E L L A N E O U S B I O C L I M A T O L O G I C A L D A T A

Section B: Symposia of National Societies

THE EFFECTS OF POLLUTION ON LIVING MATERIAL

by

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The subject of the Institute of Biology's symposium for 1958 was one of interest to many members of the International Society of Bioclimatology and Biometeorology. Held in the Lecture Hall of the Royal Geographical Society, London, on 25-26 September 1958, the symposium comprised fourteen papers on various biological aspects of pollution. The first six of these were concerned with various aspects of water pollution and therefore do not come within the scope of this Journal; but most of the remainder dealt with the effects of air pollution on living organisms.

Hazards and nuisances of air pollution from the burning of coal have been recognised in varying degree since the thirteenth century, but in spite of technological improvements the basic problems of preventing the emission of smoke and sulphur fumes and of obviating the damage they cause, have remained unsolved. As Dr. E.T. Wilkins (Department of Scientific and Industrial Research) pointed out in a paper on chemical and physical effects of air pollution on living material, the use of coal in Britain at the present time amounts to about 200 million tons annually and some 20 million tons of oil are also consumed. The emissions of dust smoke and sulphur dioxide resulting from the use of these fuels have been estimated at 0.8, 2 and 5 million tons a year respectively. In addition, the concentration of carbon monoxide in petrol-engine exhausts is several hundred times the toxic limit, although the rate of dilution after leaving the exhaust pipe is extremely rapid. Drivers and passengers of cars and other vehicles may inhale as much as 130 p.p.m. of carbon monoxide, if not more, the effect of which might well be to slow the driver's mental reactions and make him more accident-prone. With regard to "smog", it has been shown that the daily mortality follows closely and with little time lag, the daily changes in pollution as measured by smoke and sulphur dioxide.

Dr. J.K.A. Bleasdale outlined the results of pollution on plant growth and described experiments showing the effects of pollution in reducing the effective light period per day. Tarry deposits on leaves further reduce the light available and gaseous pollutants also have these effects. Sulphur compounds play an important part in regulating cell division and Dr. Bleasdale suggested that they might effect the rates of litter-production and leaf-formation by rye grass.

The effects of atmospheric pollution on man were described by D.P.J. Lowther (Medical Research Council), who emphasised that the bewildering diversity and contradictions to be found in the vast literature relating to air pollution should not be allowed to diminish public anger and disgust at the tragic effects of the use of the air as a sewer.

In Britain, chronic fluorine poisoning or "fluorosis" occurs almost exclusively in animals in industrial areas, said Dr. Ruth Allcroft and arises from aerial contamination of herbage by the emission of fluorine-containing gases and dusts from industrial plants. The total economic loss occasioned is not great compared with that caused by other diseases, but is a matter of serious concern to farmers whose stock are affected. Dr. Allcroft illustrated her lecture with a film showing fluorine poisoning in cattle. The effects of this appeared to cause such acute agony and suffering to the wretched animals that surprise was expressed by members of the audience that such a disgraceful state of affairs should be tolerated.

The uptake of radioactive fission products by plants was discussed by Dr. H.J.M. Bowen, whilst their effect on aquatic organisms formed the subject of a paper by Mr. W.L. Templeton. The writer of this review was most impressed by the care applied by members of the Research and Development Branch of the United Kingdom Atomic Energy Authority to the establishment of safe levels of radioactivity in organisms that directly effect man.

Finally, a challenging and stimulating contribution by Dr. T.C. Carter (Medical Research Council's Radiobiological Research Unit) stressed the need for new experimental data on the nature of the radiation dose/mutation relationship in low dose ranges, in order that minimal criteria may be determined. At present this relationship is completely unknown in the case of mammals. Yet, if it is other than linear, the whole logical structure supporting present-day assessments of the genetical hazard to man of nuclear and allied radiations, collapses like a house of cards.

As in many previous Symposia of the Institute of Biology, the unfortunate dichotomy between purely scientific, economic and political motives was manifest. One could not help reflecting that the real difficulties are probably social and financial rather than biological, and present problems of ethics rather than of science.

The proceedings of the symposium will be published by the Institute of Biology, 41, Queen's Gate, London, S.W. 7.

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