

successful one on the basis that the number of errors which can occur is relatively small and these are usually caused by not following the correct procedure or making unauthorized alterations to the densitometer. The technique therefore plays a valuable role in the pollution monitoring programme and it is possible to have reasonable confidence in the data which is currently being collected. This data base may be usefully tapped for other research projects and for

the assessments of the current smoke pollution situation in South Africa.

ACKNOWLEDGEMENT

The work and dedication that many municipal officers displayed in the performance of their duties made this assessment possible.

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ASSOCIATION NOTES

INDOOR AIR POLLUTION – RADON IN HOUSES

– *IUAPPA Newsletter*

The provisional results of a UK survey into radon in houses were presented to the Conference of the National Society for Clean Air in October 1985 by the National Radiological Protection Board. The NRPB concluded that radon, a naturally-occurring radioactive gas, is the most significant source of radiation exposure in the country but that there are marked regional variations.

Radon gas is created by the trace quantities of uranium in the ground and in building materials. The gas moves through rock and soil or brick and concrete and enters the atmosphere. Levels in outdoor air are low, but radon accumulates indoors because of restricted ventilation. It undergoes radioactive decay into solid products, which are also radioactive; these attach themselves to dust particles in the air, which, when inhaled, irradiate the lung.

The National Radiological Protection Board has conducted a survey of radon in dwellings throughout the UK and several smaller studies in regions where levels were expected to be above the national average. Higher levels are particularly likely in and around granite areas where the uranium quantities are higher than average.

Provisional results from the survey show that radon concentrations in London are about half the average value, in eastern England about average, and in south west England about three times the average. The highest regional levels were found in Cornwall, where typical values were around ten times the national average, with some samples over 10 times higher still. Elevated levels were also found in Devon and in the Pennines region but, contrary to expect-

tation, levels in Aberdeen were below the national average. This unexpected result was attributed to the type of granite and local building practices.

While there is no *direct* evidence that exposure to radon decay products in the home causes harm to human beings, there is evidence that prolonged exposure experienced by uranium and other miners to high levels of radon decay products underground has caused lung cancer. Therefore, the NRPB researchers have made the cautious assumption that there might be a proportionate risk to the public at the levels of indoor exposure found. The NRPB are now working together with the UK's Building Research Establishment to develop methods for reducing radon levels. Techniques under study include: increasing the ventilation rates; preventing the gas from entering the home; and extracting the gas under the floor. Also under consideration is possible remedial action for existing dwellings and preventative action for new buildings in some regions.

In the United States, too, there is growing concern about radon contamination. Both Congress and the Senate have made provisions for funding further radon studies, and congressman James Scheuer, a sub-committee chairman with the Science and Technology Committee, has said that he may introduce a Bill to force more action if the US Environmental Protection Agency does not tackle the problem more aggressively. The EPA is already undertaking a national survey to locate naturally-occurring radon and evaluate its potential for harm. With evidence mounting of potentially dangerous levels of contamination in several states, it may be only a matter of time before more definite proposals emerge.

The results show that there is a strong relationship between the Soiling Index of smoke concentration and the total carbon concentrations in the aerosol. This supports the original concept behind the development of the standard sampling unit, in that the method measures the black particles and is normally not influenced by the light-coloured natural dust particles which are also collected on the filter.

The average concentration for total carbon obtained in Pretoria over the whole sampling period was $24,7 (\pm 13,9) \mu\text{g}/\text{m}^3$. Pratsinis et al. (1984) gave two values of $15,8$ and $28,0 \mu\text{g}/\text{m}^3$ for total carbon in Los Angeles. Ohta and Okita (1984) found concentrations of between 5 and $18 \mu\text{g}/\text{m}^3$ around the Tokyo Bay area. At present because of the many different measurement techniques in use for

the determination of carbon, direct comparison between studies is not only difficult but can be misleading.

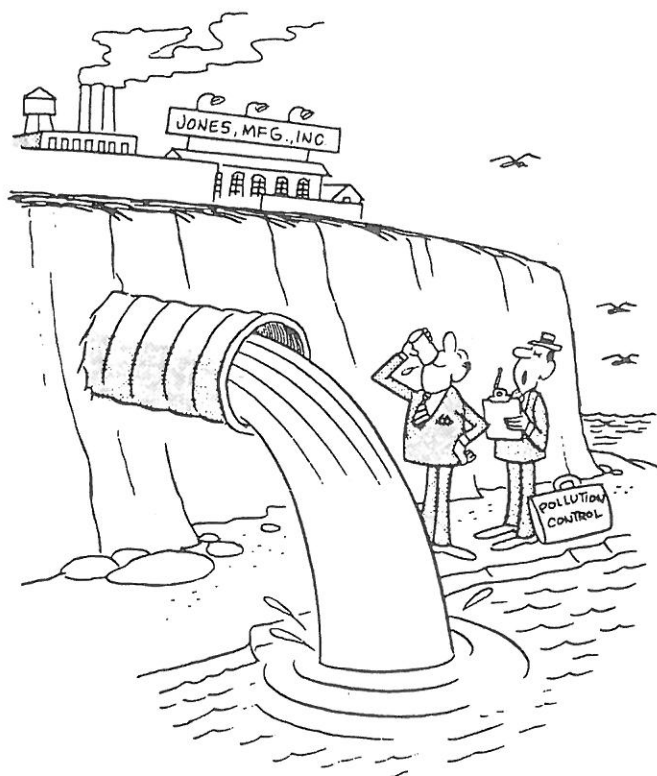
In the future, due to increased use of diesel automobiles, the increasing emission of elemental carbon should be of concern. For example, Pratsinis et al. (1984) concluded that between 27 and 44% of the incident light extinction can be attributed to the carbon containing component of the aerosol.

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"But our department doesn't consider that a reliable test of your effluent's quality Mr Jones".