

**UNIVERSITY OF THE THIRD AGE, CAMBRIDGE**  
ENVIRONMENT COMMITTEE

*Is Cambridge Air Killing You?*  
**AIR POLLUTION SEMINAR REPORT**

Friends Meeting House, Jesus Lane, Friday February 10<sup>th</sup> 2017

This seminar sought to explore the extent and causes of air pollution and strategies for coping with living in Cambridge; a city with heavy road traffic producing noxious fumes, called 'Invisible Killers'.

Elizabeth May, the chairwoman of the U3AC Environment Committee welcomed 47 members to the seminar. Brian Wallis, the committee's vice chairman ran the event.

Heather Wallis described how we cope with problems in our lives. Our negative feelings drive us in various directions. Often we ignore, even deny a problem and try to behave as if the issue doesn't exist; the stiff upper lip British way. We all have favourite, sometimes habitual mechanisms such as shopping, food, drink, drugs, sex. Some of these may have bad effects on us and cause a vicious downwards circle. We can get locked into negativity.

But we need to acknowledge negative feelings and then move on to improve matters. We could imagine a cardboard box into which we could dump our negative issues and a cup into which we could pour our positive feelings and experiences.

Positive feelings produce brain hormones which make us feel good.

Brain and body are interlinked so negativity can harm our immune systems and slow down the body's healing mechanisms.

So what should we do? We should consciously decide to take charge and focus on building good feelings and behaviours. These will include; music, gardening, self-expression such as writing, singing, painting, drawing; friends and family, contributing to our community, learning (U3AC!), exercise, yoga, even counselling. We should not bottle up the issue. We should eat well; junk food does not help our bodies nor our minds. We should take power back over our lives; signing petitions, voting etc.

With air pollution we should find out information about the problem and the solutions. We could drive less even consider getting rid of our cars, fly less (pollution at higher altitudes and has higher climate changing –effects) turn car engines off when in a traffic queue or waiting. We could buy an electric or dual fuel car. Traveling by walking or cycling reduces the amount of air pollution we inhale and this is further reduced if we avoid busy streets. Plants reduce air pollution and we might even consider domestic air pollution from the chemicals we use. We could sign petitions and join campaigning organisations.

She recommended: **Evolve Your Brain: The Science of Changing Your Mind**, Dr Joe Dispenza and a website, [www.doctoryourself.com/](http://www.doctoryourself.com/) run by Dr Andrew Saul.

**Dr Alison Grieg**, Director of Education for Sustainability, Global Sustainability Institute, Anglia Ruskin University RU spoke about Air Pollution. (PowerPoint presentation is available on U3AC Website under Environment.)

Air Pollution was defined as; *presence or introduction into the air of a substance which has harmful or deleterious effects.* (OED).

She pointed out that air pollution can happen naturally with volcanoes and forest fires. Humans are increasingly polluting the atmosphere. But the effects depended on concentration eg carbon dioxide was necessary at very low concentrations for plants to photosynthesise, but rising levels due to humans burning fossil fuel was causing global temperature rise and climatic change.

It was hard to remove pollutants from the air. Sunlight caused the pollutants to change. There was a cocktail of air pollutants and it was hard to predict what would be produced in the air and in our bodies.

Common air pollutants are:- carbon dioxide, sulphur dioxide, nitrogen oxides (commonly called NOX), volatile organic compounds, ozone, hydrocarbons, lead and other heavy metals, small particles often called Particulate Matter with the size in micrometres,  $\mu\text{m}$ , (a millionth of a metre eg PM10).<sup>1</sup>

#### Particle Size

9-30  $\mu\text{m}$  (micrometres see above) visible - smoke

5.5 to 9  $\mu\text{m}$ . These settle in the nose and throat

3.3 to 5.5  $\mu\text{m}$ . Lodge in main tubes of lungs

2 to 3.3  $\mu\text{m}$ . Settle in small breathing passages

1 to 2  $\mu\text{m}$ . Smaller tubes in lungs

0.3 to 1  $\mu\text{m}$ . Smallest tubes and air exchange sacs – (bronchioles and alveoli)

Currently information is emerging about the effects of these small particles on our bodies. These particles irritate the lungs and cause lesions, mucus production and sometimes allergic reactions. There are probably some effects due to interactions between the different types of particles.

Air Pollution is not a new problem. The first reported event was that Queen Eleanor, wife of Henry the Third was warned against the polluted air of Nottingham in 1257. The industrial revolution brought air pollution. However in 1952 the Great Smog brought in the Clean Air Act in 1956. Smoke free zones were introduced but there was also a change in domestic heating to gas and oil central

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<sup>1</sup> The size of the particle determines how far into the body it can access. Humans are protected from air contaminants by the filtering action of cilia, mucus production and the coughing and sneezing reflexes.

heating. Acid rain due to sulphur dioxide had been reduced by increasing the height of chimneys and removing the gas by washing the chimney gases.

Now in the twenty-first century the main air pollutants were due to car emissions. We had been encouraged to switch to diesel as it produced much less climate changing carbon dioxide, but we were now realising that diesel produces these particles. Petrol cars in response to legislation now produced reduced amounts of carbon dioxide (but still more than diesel- fuelled vehicles) and other pollutants.

There was a dilemma; petrol cars produced more carbon dioxide which is the main greenhouse gas which has global climate change effects, but diesel engines produce more local pollutants, particulates which are concentrated in narrow city narrow streets/canyons.

Air pollution has been shown to cause deaths. The World Health Organisation in 2014 estimated these to be seven million premature deaths annually. These are mainly people who are already ill. They die of strokes, heart and lung disease, lung cancer and chest infections, latter especially in children. It is estimated that city air pollution reduces life expectancy by 3-6 months.

Recently it has emerged that wood- burning produces these small particles too<sup>2</sup>. Although wood-burning stoves had to conform to certain standards there was some discussion that these might be made tighter.

Our third Speaker was Jo Dicks, the Environmental Quality and Growth Manager of Cambridge City Council. (His PowerPoint presentation is in the environment section of the U3AC Web site. The City's reports on Air Pollution are on the City's website. The latest Air Quality Action Plan was published in November 2016.)

Cambridge has an air quality problem because of its high traffic volumes and its ancient narrow city streets. Traffic produces nitrogen oxides (NOX) and particulate matter. There are about 250 premature deaths a year in Cambridgeshire due to air pollution.

The local authority has a legal duty to monitor air pollution and review it against health- based objectives. In the UK this legal duty is applied by different local authorities to differing extents. Not much data is collected nationally.

The city uses about 50 sites for diffusion tubes which measure NOX. These are changed monthly. NOX is widespread, on streets, and playing fields. There are also five expensive continuous monitoring sites which measure particulates and gases<sup>3</sup>. NOX is particularly high around the bus station, near the A14 and M11 and the Newmarket Road/East Road.<sup>4</sup>

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<sup>2</sup> Some have estimated that half the particulate matter in (Copenhagen London's) air was due to this. (New Scientist 4/2/17).

<sup>3</sup> Up to date figures are published on web.

<sup>4</sup> Map shown – see presentation on U3AC website- environment section.

Traffic volumes had not increased and vehicle engines had improved due to legislation.

Analysis of vehicle numbers and types in a particular location could be used to assign pollution to vehicle types and had been used to determine policy. For instance, a large amount of city centre air pollution was due to buses and taxis. So, the Council had worked with the bus companies and taxis to improve their fleets. But although pollution fell it did not fall as much as predicted. As a result, the Council funded a project to measure how much gases were really being produced by buses and taxis in real life. The results showed that although pollution had decrease, it was not that predicted by the European Standard specification. The buses were designed to be less polluting in the test situation.

Comment [SaEM1]:

Electric and dual fuel vehicles were considerably less polluting but were much more expensive.

So as a result of its work the Council was now going to encourage the bus companies and taxis to switch to dual fuel and electric vehicles, and was to install electric charging points throughout the city to encourage the use of electric cars etc. (There was some discussion that this shifted the pollution to the vicinity of power stations but proportionately less pollution was produced.)

The Council was also considering a Clean Air Zone and would seek to stop polluting buses, taxis and National Express coaches entering it.

There was discussion about turning engines off when idling. New buses did this automatically. The bus companies had reduced their fuel costs by doing this although a few people reported that they had observed bus drivers switching their engines back on again.

After a question and answer session each of the speakers gave their take home messages. On coping with problems, Heather advised us not to feel disempowered but to do something! Jo, stated that we should press for electric and dual fuel vehicles. Alison agreed that we should opt for electric buses and taxis, but the electricity should be generated using renewables as fossil- fuel produced electricity would produce more greenhouse gases.

Elizabeth May thanked the speakers, the organisers and the seminar's participants, and then gave an overview of the seminar.

It had emerged that air pollution was not a new problem but in the twenty- first century new pollutants had emerged unexpectedly. These small particles and NOX could invade our lungs and cause premature death. We could personally do something about this by reducing our car use, traveling by bike, bus or walking, or car sharing, and even not making unnecessary journeys. There were walking and cycling web sites which helped plan reduced pollution journeys. Car air inlets let in the polluted air and thus cars were healthier than walking or cycling. The further we were from the road the less pollution. Plants and trees reduced pollution.

*Elizabeth May 14/02/17*