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Science & Public Affairs

Global warming, cooperation and engagement

Nutrigenomics: the future of nurition?

Scientific advice in drugs classification

British Association for the Advancement of Science

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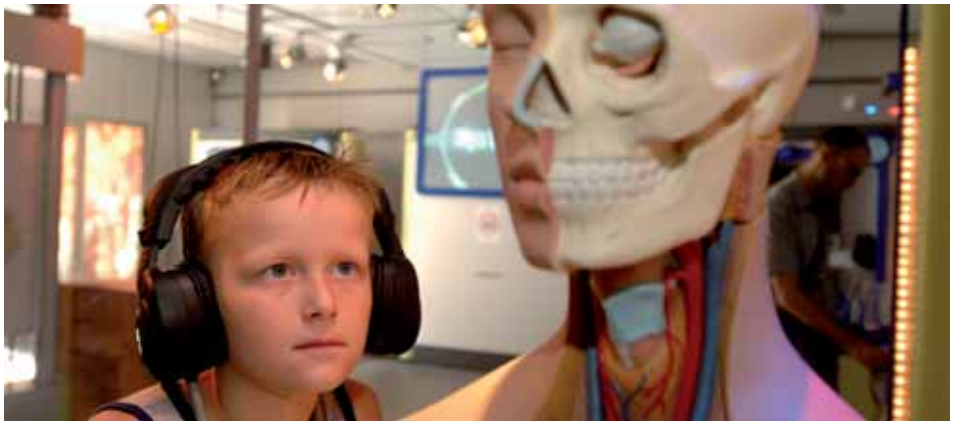

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Front cover picture: Publicising the challenge of climate change: see p.6 *Jon Challicom*

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Features

Energy, scientific advice and the future of diet

This issue looks forward to some of the subjects parliamentarians will be dealing with when they come back from their holidays in October.

Following the publication of the energy review, the white paper is expected around the turn of the year. Vanessa Spedding (p.8) delineates the battle lines between the nuclear and renewables camps, while Colin Axon and his colleagues (p.18) point to a little-remarked infrastructure problem. The UK grid was designed for a relatively small number of large power sources, not a large number of small distributed ones, they write, so it is not a straightforward matter to bring on-line large quantities of district- and domestic-scale generators. Nobody knows, they warn, how the grid will behave under those conditions.

Parliamentarians need scientific advice to legislate on these and other technical questions. November will see the Commons Science and Technology Select Committee publish its report, *Scientific advice, risk and evidence: how government handles them*. Already, the Committee has published the case studies on which the final report will be based. On drugs policy, Committee Chairman Phil Willis (p.17) is highly critical of the Advisory Council on the Misuse of Drugs, whose behaviour has 'created fertile ground for suspicion and conspiracy theories', as well as hindering public understanding of its role. Our new columnist, Tracey Brown (p.29), expands on the same theme, asking what constitutes scientific evidence in the first place. She argues that the status of scientific evidence is as important as its conclusions.

The problems parliamentarians face when they are advised by scientists are laid bare by John Bowis MEP (p.15). He took part in a Royal Society-sponsored scheme for MEPs and scientists to visit and observe each other at work. By chance, he visited Mark Enright (p.14) on the day when the MRSA deaths at Stoke Mandeville were hitting the headlines – an issue bang on Enright's expertise. Reflecting on scientific advice, Bowis explains how the precautionary principle has won out over the idea of proportionality of risk. If a parliamentary committee has accepted advice from a scientific advisory body, but some other scientist questions the advice, the parliamentarians will, he says, 'second guess the advice we have received and go... for tougher standards or restrictions than may be necessary.'

The UK is about to have a new body to see what is happening in science, engineering and technology, what might happen and how the political process should handle it. Ian Gibson (p.30) outlines plans for his new think-tank, called Newton's Apple. And amidst all this science and politics, the Conservative Party is re-thinking its science strategy, as Ian Taylor relates (p.16).

The SPATalk (p.4) argues out the merits and demerits of nutrigenomics, the effect of our entire diet on our genes, proteins and metabolism. Its enthusiasts hope it will lead to personalised nutrition, while its detractors maintain it will do nothing to help poorer people who are at higher risk of heart disease and diabetes.

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The causes of childhood leukaemia

Ken Okona-Mensah asks whether staying indoors could contribute

The UK and other industrialised countries may be witnessing an increased incidence of the most common form of childhood cancer – leukaemia.

Around 400–450 new cases of leukaemia occur in UK children each year; the most common type being Acute Lymphocytic Leukaemia (ALL).

Despite huge medical advances, leukaemia remains a devastating childhood cancer, with cure rates varying from 10 to 90 per cent. The biggest obstacle in research is identifying the causative factors. As it is a biologically diverse disease, there are many factors which may be responsible, which further complicates research. To help raise money for further research, a national campaign called 'Leukaemia Research Awareness Week' will take place during the last week of September.

Environmental factors

Currently one out of every 2000 children living in the UK will develop ALL. The risk, which is higher in industrialised, developed countries, suggests that environmental exposures may play a role.

Many investigators have attempted to link environmental risk factors with the development of ALL, but the evidence has not been strong for any one particular factor. Aside from certain genetic diseases, the strongest evidence points to urban-rural population-mixing, and a delay in exposure to common infections during infancy in susceptible children (who are possibly exposed to DNA-damaging environmental agents before birth).

UK review

In 2004, the UK Department of Health's independent expert scientific advisory committee, the Committee on Carcinogenicity (COC) examined the available scientific literature to determine whether exposure to chemicals in the environment could be associated with the development of childhood leukaemia.

Several scientific studies in the past have suggested that exposure to pesticides, cigarette smoke, and parental exposure to occupational solvents may play a role. However, the COC considered that there was no strong evidence from these studies that chemicals were involved in childhood leukaemia. It did decide, though, to carry out a detailed review of recent reports that residence near to busy roads, petrol stations and garages can lead to high levels of exposure to traffic exhaust and petrol fumes, and that these might play a role.

Traffic exhaust and petrol fumes contain chemicals known or suspected to cause cancer. Benzene is well known to cause leukaemia in adults exposed to high air levels at work. For children, exposure to petrol fumes and traffic exhaust occurs mainly from travelling in cars, during visits to petrol service stations and also from staying indoors (in high traffic areas with large numbers of parked cars and indoor garages).

Exposure indoors

The COC found that there was no basis on which to conclude that living close to petrol stations, garages and road traffic leads to an increased risk of a child developing leukaemia but suggested that children's exposure to sources of petrol vapour and benzene inside the home warranted further investigation.[1]

Research shows that levels of benzene indoors can be considerably higher than that outdoors, particularly in homes with an attached garage. Around 22 per cent of UK houses have an attached (integral) garage, usually sharing a common wall or interconnecting door to the living area with the vehicle owner's home. A room located directly above the garage can have benzene air levels 2.5 times the ambient air standard. However, other sources such as building and furnishing materials, environmental tobacco-smoke, particle-board furniture, floor adhesives, paints and wood panelling contribute to air levels of benzene inside the home.

A recent study estimated that children staying in their homes absorb the highest levels of petrol vapour, due to the amount of time they spend indoors. The study also found that (on a body-weight basis) children absorb more than six times the amount of benzene indoors compared to adults.

The European Union has reduced the maximum level of benzene permitted in petrol from five to one per cent. Current UK air quality legislation sets an ambient air objective for benzene (by the end of 2010) of 5 $\mu g/m^3$ in England and Wales, and 3.25 $\mu g/m^3$ in Scotland and Northern Ireland.

Raising awareness of leukaemia
Leukaemia Research Fund

Understanding causes

Leukaemia Research, the national research charity responsible for co-ordinating the Leukaemia Research Awareness Week, is devoted to funding research almost exclusively into leukaemia and other related diseases of the blood.[2]

Analysis of cancer research activity in 2002 by the National Cancer Research Institute showed that only 16 per cent of funding goes towards efforts to understand the causes of most cancers (compared to 41 per cent allocated toward understanding the biology of cancer). An understanding of the causes of childhood leukaemia would help the development of prevention strategies and ultimately help reduce the risk of leukaemia in children.

References

1. See http://www.advisorybodies.doh.gov.uk/coc/childleukaemia.htm
2. See www.lrf.org.uk

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This article represents the view of the author only and is not intended to represent the views of the Department of Health or Imperial College.