

Gas leakage in United Kingdom

SIR — Independent analysts agree that gas leakage from cast-iron distribution systems is high. Half the gas distribution mains in the United Kingdom are made of cast-iron, pre-dating the 1969 change to natural gas, with a few dating from the Victorian era. Herbert's attack¹ on my Commentary² cannot hide this fact.

British Gas has been unable to refute figures in the 1990 study for Greenpeace³ giving several per cent methane leakage; it has instead embarked on a measurement programme costing more than £2 million.

The company spends £40 million a year on adding 'conditioners' to combat the drying out and subsequent leaking of joints. But application is limited and inconsistent between regions. Droplets do not carry far and penetration to the periphery of the network was found inadequate. The data behind Greenpeace's 15 per cent effectiveness (low-pressure network average) is unrefuted. The new 'WISE' method involving direct injection into low pressure mains via standpipes has not been generally adopted.

British Gas keeps most figures secret. Herbert¹ objects to my use² of aggregated costs for pipe replacement that omit the customer payments, but not to my upper figures (obtained informally) which are only 50 per cent higher. Subtracting the expenditure on 'conditioning', at £300 per km (or £1,000 per km for low- or medium-pressure gas mains), the net annual costs of gas-pipe replacement (at 10 per cent discount rate) are £2,710 and £3,370, respectively, per km of mains.

At the median Greenpeace leakage rates², savings in lost gas at 20 p per therm are 33 per cent of the net discounted replacement costs, while at their upper leakage rates they are 67–99 per cent. Reduced need for inspection and repairs would add to these savings.

The above figures exclude the greenhouse pollution costs of the escaping gas. On the basis of the proposed EC carbon+energy tax (at \$5+\$5 per barrel of oil equivalent), I calculate 34 p per therm would be due on leaking methane. Using that notional figure, the value of gas saved by renewing median-leaky mains rises to 90 per cent of average discounted costs. Evidently, taxing methane pollution would provide a significant incentive to speed up the renewal programme (30 years to replace the cast-iron mains in the United Kingdom at current rates).

I suggest that the UK government needs first to repudiate officially the low leakage figure that British Gas has been unable to defend; second, to establish

effective monitoring and controls on the methane pollution from fuel industries; and third, to consider the practicality of extending carbon/energy taxation to cover that methane pollution. Ofgas might be the appropriate regulatory body, rather than the Pollution Inspectorate (but see ref. 4), able to ensure that environmental impacts of gas leakage are covered in the tariff formula and/or performance standards.

M. K. Wallis

*School of Mathematics,
University of Wales,
Cardiff CF2 4AG, UK*

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Serbia defended

SIR — After a lengthy delay our library has finally received issues of *Nature* for 1991, where I found a letter, "Appeal from Croatia" (*Nature* **350**, 176; 1991), which requires a response.

For the third time in recent history, the Serbs are accused of resisting the new world order. In 1914, Serbs in Bosnia and Herzegovina did not want to accept their annexation by Austria. In 1941, Serbs began the war against Nazism by breaking the pact with the Germans, resulting in thousands of them being massacred by collaborators among the Croats and Muslim slaves. Now, this resistance is interpreted by the authors of the "appeal" as the ancestral sin of the Serbs, going back to the Middle Ages.

In support of the Croats' claim of a highly civilized origin, the authors of the "appeal" cite Nikola Tesla as a Croat scientist and Nobel prizewinner. This may be how Croats persuaded many other Nobel prizewinners to sign appeals against 'Serbian aggression' within disintegrated Yugoslavia. But a look at historical textbooks and biographies shows that Tesla was in fact a Serb from Krayina who never won a Nobel prize, even though his discoveries of alternating current, electromagnetic induction and the construction of the first power station were of immense value.

There is also much evidence that the Serbs have supported democracy in the past, for example the democratic movement of Serbian students in Belgrade in 1968 and the introduction of European democratic institutions in the Balkans after the Turkish occupation.

I wonder if readers took the trouble to

check the facts in the "appeal from Croatia". The extent of anti-Serb propaganda throughout the world leaves colleagues and friends mute with astonishment. Serbian scientists and their colleagues are silently watching a new genocide of their people, hoping that the truth will somehow reach scientists elsewhere, who are supposed to be truth's servants.

Snežana Obrenović

*Institute for Biological
Research "Siniša Stanković",
29. novembra 142,
11060 Belgrade, Yugoslavia*

Human insulin

SIR — Kiln and Sugarman¹ mention a number of diabetic patients whose awareness of hypoglycaemia was reduced during human insulin treatment but returned when they were transferred to porcine insulin. They claim that "no account has been taken of this fact by anybody". In fact, four separate studies have now been reported in diabetic patients selected specifically for having reported impaired awareness of hypoglycaemia during human, but not animal, insulin treatment²⁻⁵.

Hypoglycaemia induced by human and porcine insulins was compared under laboratory^{2,3} or 'free-range'⁴ conditions, or both⁵, in subjects who did not know which insulin species was being administered. None of these studies found any differences between human and porcine insulins in the physiological, endocrine or symptomatic responses to hypoglycaemia.

This issue has caused much concern among diabetic people and health-care professionals. Despite the weight of evidence that human insulin does not interfere with perception of hypoglycaemia, some diabetic patients may still have fears about human insulin and they should be transferred to animal insulins without delay and without argument. Otherwise, it is now time to turn attention to the many other pressing problems of diabetes. Kiln and Sugarman are worried that "we are still sitting on a human insulin timebomb". If they listen carefully, they may well discover that this particular timebomb has stopped ticking.

Gareth Williams

Alan W. Patrick

*University of Liverpool,
Department of Medicine,
Liverpool L69 3BX, UK*

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