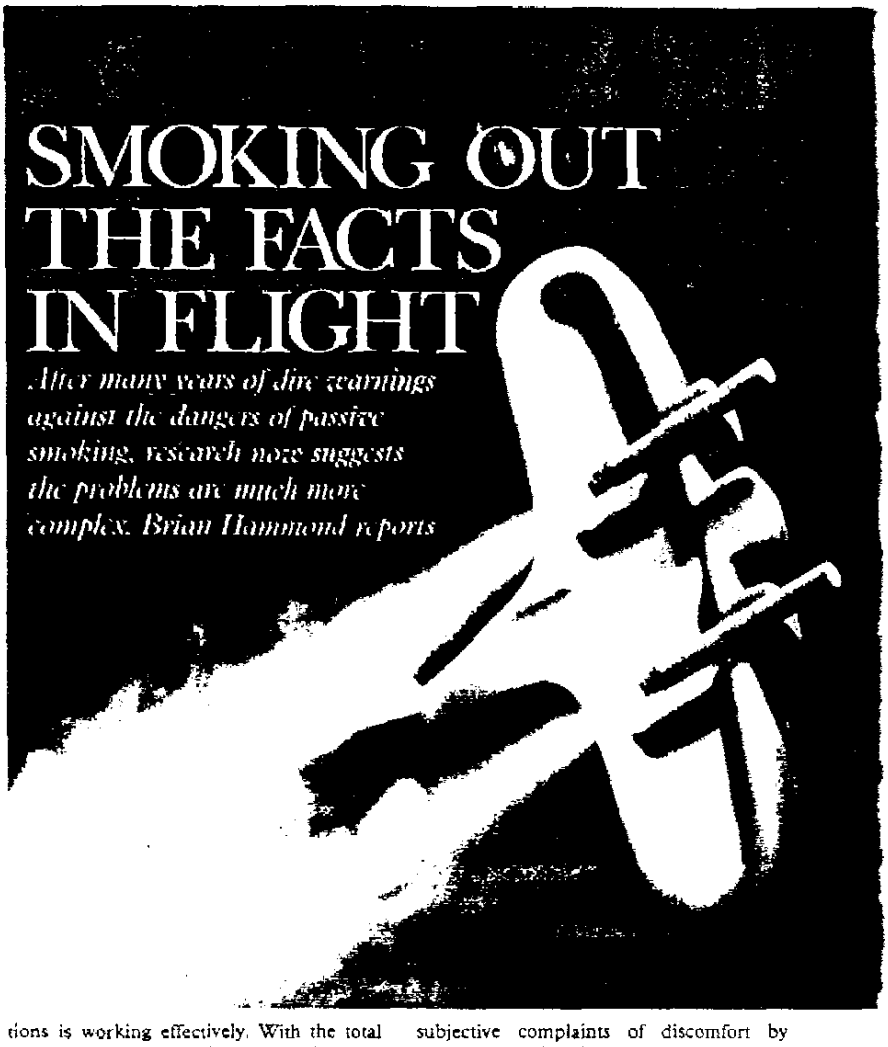
SMOKING OUT THE FACTS IN FLIGHT

After many years of dire warnings against the dangers of passive smoking, research now suggests the problems are much more complex. Brian Hammond reports



SETTING UP as a health pundit, it seems, is an increasingly traumatic business. All the things we were once recommended as guarantees of long life – eggs, cheese, red meat, apples, even mother's milk – turn out to be dangerous, if not fatal. Over-confident assertions by experts about what is good for you seem to have a life expectancy similar to that of a second lieutenant in the First World War.

In this context, it is less surprising that passive smoking may not after all be the villain of the piece. This is despite the success of the front-line trenches of a non-smoking health lobby, which has already persuaded a number of the world's commercial airlines to cut back on smoking sections or even ban them outright.

According to several weighty academic studies reaching the scientific press, the discomfort experienced in flight by some passengers reporting breathing problems, coughing and irritation of the eyes, together with other nasty symptoms, is unlikely to be caused by the environmental tobacco smoke generated by smoking sections.

The definitive round-up of research on the topic has been carried out by Dr Larry Holcomb, president of the Michigan-based Holcomb Environmental Services group, ex-university professor of biology and one-time senior UN Development Agency staffer. The report – admittedly commissioned by the tobacco industry – takes in a global network of research papers produced among others by the US Federal Aviation Administration, the National Institute for Occupational Safety and Health, the US National Academy of Sciences, the US Surgeon General, and Lufthansa.

This compendium of findings – under the title *Impact of Environmental Tobacco Smoke on Airline Cabin Air Quality* – examines the spin-off products of smoking in the flight cabins: carbon monoxide, particulate matter, nicotine, and oxides of oxygen and ammonia.

Where measurable, these levels only reached between 10% and 25% of environmental health standard levels. They are based on the normal working week – and the fact that few frequent travellers fly for more than 10 hours a month improves the position. Even flight attendants, the group theoretically most at risk, and flying up to 80 hours a month, "receive minimal doses of environmental tobacco smoke constituents," says the report.

Further findings, based on the movement of air within the cabins when air conditioning is operating, argue that the separation between smoking and non-smoking sections is working effectively. With the total volume of air changed some 20 times an hour in the average commercial flight cabin, "there is little mixing of air from one air treatment zone to another. Cabin air typically moves from ceiling to floor, with only a slight flow from the front of the cabin to the rear".

The conclusion is forthright: "The available scientific evidence does not support the prohibition of smoking on commercial aircraft. The data that are available reveal low concentrations of substances that can be traced to environmental tobacco smoke in smoking sections, and even lower concentrations in non-smoking sections, thus confirming the efficacy of current in-flight smoking policies. The available data also suggests that factors or substances other than ETS may be major contributors to subjective complaints of discomfort by passengers and flight crew.

"Finally, given the limited and intermittent occasions for exposure, even in the case of compromised individuals (those suffering from lung/heart medical conditions), adverse health effects from exposure to ETS aboard aircraft are highly unlikely."

Where, then, does the blame really lie for in-flight discomfort? There are three major suspects.

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Ozone levels

The few studies of ozone levels in aircraft cabins argue that some 11% of flights monitored by the FAA contained ozone levels well beyond the FAA limits of 0.25 per passenger mile – most people can detect ozone at concentrations of 10% of that figure.

Excess ozone exposure – present in greater concentrations in the upper air drawn in by in-flight ventilation systems – produces symptoms of discomfort in eyes, nose and throat, can bring on a persistent cough, and cause problems with breathing. The effects usually disappear within two to four hours of landing.

Relative humidity

The amount of water vapour in the air at given temperatures greatly affects passengers' well-being. The most comfortable level has been identified at betweeen 30%-60%. On most flights, relative humidity is painfully low, at less than 10%, because of the dry air brought in from the upper atmosphere during flight. The effects of this have been categorised as eye irritation, particularly for those wearing contact lenses; and irritation of the throat and lungs.

Carbon dioxide

This effect only occurs when the in-flight ventilation system is inefficient or set low. Carbon dioxide – mainly produced by passengers' breathing – in undue concentration, produces faster breathing rates and the sensation that the cabin is becoming stuffy.

A highly complex direct study of environmental tobacco smoke measurements was carried out by an American scientific team led by noted transportation specialist Dr John Drake, using specially developed analytical equipment on Japan Airlines flights between Tokyo and New York (13 hours' duration) and Tokyo and Hong Kong (a 5hr. journey).

Using to portable air sampling systems, sited randomly within smoking and non-smoking zones and individually monitored, the concentration of smoking-generated nicotine, respirable suspended particles and ultraviolet particulate matter was checked throughout the flights.

The findings were that, "estimated exposures to environmental tobacco smoke would be .0017 cigarette equivalents an hour in non-smoking sections, and .008 cigarette equivalents per hour in smoking sections" – two thousandths and eight thousandths of a cigarette respectively.

"Estimated exposures to environmental tobacco smoke would be .0017 cigarette equivalents an hour in non-smoking"

The group also points out that: "It is important to recognise that the 'cigarette equivalent' result provides an estimate of exposure, not to be confused with dose – that is, the amount of ETS components a person might breathe and retain in the body. It is inaccurate to assume that a person 'smokes' the air as he or she would smoke a cigarette, both because ordinary breathing is relatively shallow and through the nose, and because ETS smoke is chemically and physically different from the 'mainstream' smoke that a smoker inhales".

These findings may be reassuring for non-smokers who have seen passive smoking as a direct threat to their health. But all airlines treat as a main priority passengers' comfort – physical, physiological or psychological hardly matters in the perception of the punters.

So more attention probably needs to be paid to correct levels of air-conditioning, to ensure that even these low residual levels of smoke are washed out as rapidly as possible.

Probably more important is an investigation of the economics of installing catalytic converters to break down ozone, and setting up humidifier points within the cabin to preserve optimum comfort. These should prove a relatively minor expense in airline economics.

It might also be worth widening the debate on air quality to include airport lounges, hotels and offices. Given the pollution already attacking the world's major capitals, a little more thought and work on the part of airline managements could mean that the executive travellers' lungs could be safer six miles up than when walking to the supermarket. **ET**

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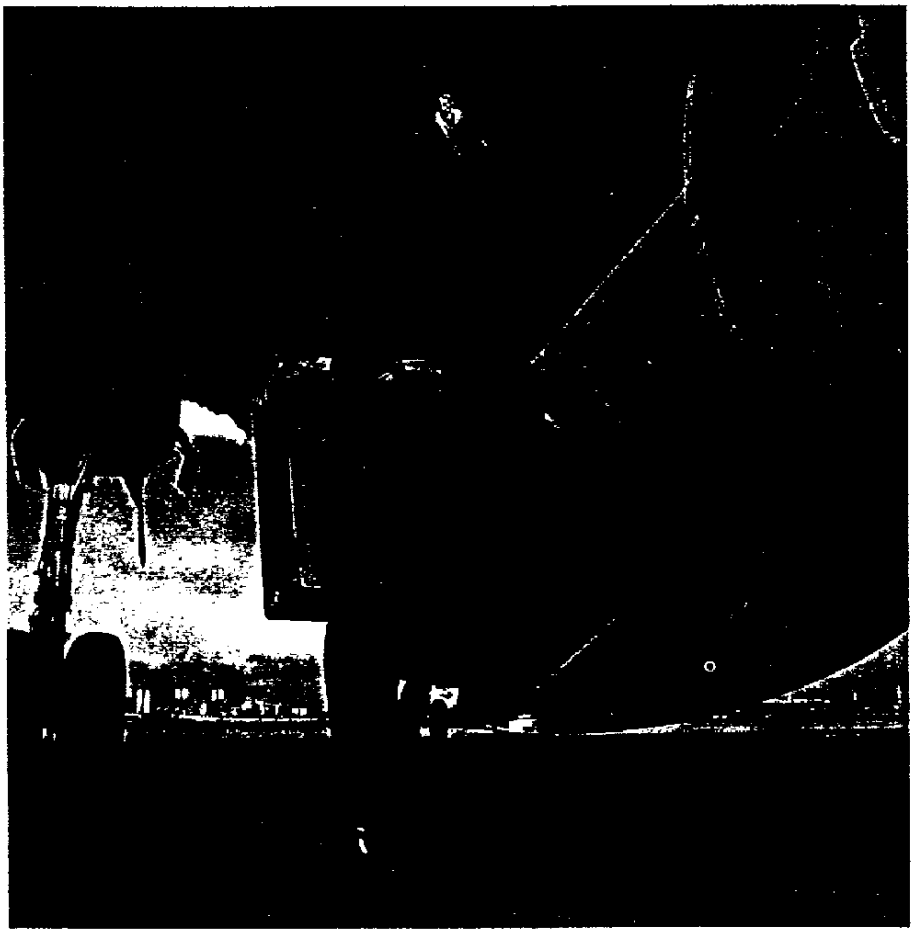

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