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CORRESPONDENCE

We may return unduly long letters to the author for shortening so that we can offer readers as wide a selection as possible. We receive so many letters each week that we have to omit some of them. Letters must be signed personally by all their authors. We cannot acknowledge their receipt unless a stamped addressed envelope or an international reply coupon is enclosed.

Carbon monoxide yield of cigarettes

SIR,—For the past 10 years evidence has been growing that carbon monoxide (CO) is an important health hazard for smokers. Mainstream cigarette smoke contains from 2% to 6% of carbon monoxide and when inhaled and diluted with air it may contain about 400 parts per million of CO, which is eight times greater than the maximum level permitted in industry. Although filter cigarettes tend to have lower tar levels than plain brands, their CO levels may be higher (if the filters are not ventilated).[1-3]

The reduction of mean tar levels associated with the increase of filter cigarettes in recent years may well have contributed to a fall in lung cancer rates in men under the age of 60. But the higher CO levels may have led to more deaths from coronary heart disease. Knowledge of carbon monoxide yields is therefore very important. It could also be of value for a patient with coronary heart disease who is unable to stop smoking to smoke a cigarette with a lower CO rather than a lower tar yield. However, the doctor wishing to advise him is at present unable to do so.

Until now the Government has been unwilling to publish the CO yields of individual brands of cigarettes, although it is known that they are measured by the Government Chemist. Is the DHSS concerned that the tar and nicotine tables would be too complicated with the addition of CO levels? Or is it unwilling to embarrass the industry with the approaching negotiations on "the voluntary agreement" which the industry had with the last Government?

There seem to be no good reasons for withholding information from the profession and anyone else who wishes to know. Publication would have the added advantage of stimulating the industry to lower CO yields of cigarettes in the same way that tar levels were reduced after the first publication of tar tables. It would also follow the recommendations of the recent WHO report.[4]

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[1] Russell, M A H, *British Medical Journal*, 1975, **3**, 71.
[2] Wald, N J, *Lancet*, 1976, **1**, 136.
[3] Copeland, G K E, paper presented at Fourth World Conference on Smoking and Health, June 1979.
[4] WHO Expert Committee on Smoking Control, *Controlling the Smoking Epidemic*. Geneva, World Health Organisation, 1979.

Self-titration by cigarette smokers

SIR,—Dr Heather Ashton and others (11 August, p 357) present results to show self-titration by smokers when they switch from smoking a middle-tar cigarette to either a high-tar cigarette or a low-tar cigarette. In that they have employed a wide variety of measurement techniques in a well-balanced study and have shown titration downwards when switching to a higher-tar product (was this passed by an ethical committee?) their study is interesting. However, the evidence that smokers attempt to compensate for reduced smoke components when switched to a lower-tar product, although admittedly to varying degrees, is consistent throughout all published studies—including our own,[1-3] in which we demonstrated puff volume, and probably inhalation, to be the important variables. Furthermore, the study by Freedman and Fletcher,[2] which is quoted as suggesting that smokers "can adapt without compensation to a moderate reduction in nicotine yield" in fact did, on reanalysis of their data,[3] show that compensation was taking place.

Like other studies in the literature this is another short-term switching study, the measurements reported all being made during the first two weeks following the switch; and the results may be confounded by the fact that the authors have combined results from their two groups—thus mixing, for each analysis, subjects switching from middle-tar control to test product and subjects switching between the two test products.

It seems clear that when subjects switch to a lower-tar product they attempt compensation, but whether this is for the pharmacological effect of nicotine (or any other smoke constituent) or simply because of the reduced impact and flavour of the lower-tar product is an unanswered (and possibly unanswerable) question. What is important is that despite the attempted compensation the intake of nicotine, carbon monoxide, and, by inference, tar is still *less* than when they were smoking the higher tar product.

What is required is a long-term study of several years' duration to show whether the attempted compensation after switching to lower-tar products persists and, if so, to what extent. Our own published observations,[1] made on subjects who had smoked either middle-tar or low-tar products for at least two years, would suggest that the compensation does not persist in that the intake of smoke