

and the concentration of anaesthetic gases reaching them is much reduced by dilution with room air and with air from other suction outlets. We have been unable to find any evidence for the alleged ill effects of anaesthetic agents on pump oil, and examination of our pumps after seven months' scavenging showed no signs of abnormal wear. We have had the active interest and co-operation of our district works officer at all times and the area authority has agreed that we can continue to use CPV until further notice.

We chose active scavenging originally because our operating rooms have no outside walls and no exhaust ducts as they use a simple plenum ventilation system. Our experience with active scavenging, however, has convinced us that it has many advantages over the passive system. The small-bore tubing that can be used is much less cumbersome than is required with a passive system to prevent excessive breathing resistance. It is less liable to be accidentally kinked and if it is the patient is not harmed. The system is more effective than the passive because any leaks are inwards. The extraction makes an audible hiss that indicates that it is working, and the patient's expirations modulate this sufficiently to make respiration audible. If CPV is available the system is very cheap to install as it requires no engineering works and no new anaesthetic equipment.

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SIR,—Dr H T Davenport and his colleagues (20 November, p 1219) are to be congratulated for describing their excellent method of monitoring the exposure of operating room staff to inhaled anaesthetics. We have recently had the opportunity to study the environmental pollution caused by nitrous oxide in a theatre which has no ventilation system. The mean exposure of an anaesthetist to nitrous oxide was determined by using integrated personal sampling as described by Dr Davenport and others. The results obtained are shown in the table.

Exposure of anaesthetist over 10-minute period: Magill circuit and spontaneous respiration (N₂O: O₂ 6:3 l/min)

	Nitrous oxide (ppm)	
	Anaesthesia induction room (10 samples)	Operating room (10 samples)
Mean ..	1824.1	1153.3
Range ..	986-2775	583-1932

We disagree with Dr P Cole (25 December, p 1563) that only blood samples will provide a simple and reliable measure of the average exposure, integrated over time. Nitrous oxide is a relatively insoluble agent. Its blood/gas solubility coefficient is 0.47 and tissue/blood partition coefficient is near to 1.0. Equilibrium between the tension in the alveolus and most tissues is achieved fairly rapidly. In our opinion end-tidal samples can provide adequate information and furthermore these are much simpler and easier to obtain from theatre personnel than repeated blood samples.

To achieve efficient control of pollution in the operating theatre environment it is essential to have a non-recirculating type of air-conditioning system, a safe and effective scavenging system for waste anaesthetic gases,¹ regular equipment maintenance and careful anaesthetic techniques to prevent gas leaks, and an air monitoring programme to indicate the effectiveness of these preventive measures.² Failure to institute any of these measures will continue to lead to excessive exposure of the operating theatre personnel to anaesthetic gases and vapours.

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¹ Mehta, S, *et al*, *Canadian Anaesthetists' Society Journal*, 1975, **22**, 271.

² Whitcheer, C, *et al*, HEW Publication No (NIOSH)75-137. Department of Health, Education and Welfare, Washington, DC, 1975.

Characteristics and prognosis of alcoholic doctors

SIR,—Dr R M Murray's findings (25 December, p 1537) of a high prevalence of alcoholism (often associated with drug misuse) in doctors are confirmed by our observations. For example, there were 11 doctors (3.0%) among about 290 male alcoholic patients in Warlingham Park Hospital in the 1950s,¹ 44 doctors (3%) among about 1500 first male admissions to the St Bernard's Hospital alcoholic unit (3.0%) between 1964 and 1976, and 41 doctors (2.4%) among about 1700 male alcoholic patients seen outside hospital between 1970 and 1976. Prealcoholic emotional instability seemed more common among our female doctor patients than among men, but in contrast to Dr Murray's series definite prealcoholic psychiatric abnormalities and personality disorder were uncommon among our alcoholic doctors; and it seems from an admittedly incomplete follow-up that most have done well as regards drinking habits and continuation with, or resumption of, their medical practice. For example, of 13 doctor patients of the St Bernard's unit over the past four years, nine have maintained sobriety and are back in general or hospital practice. Incidentally, of 120 alcoholic doctors in contact with the recently formed Alcoholic Doctors' Group in this country,² almost all have now been sober for some time and do well in their practice. The most common prealcoholic psychiatric "abnormality" reported by our doctor patients seemed to be a relatively high degree of anxiety in student days.

Doctors are clearly no exception from the general rule that under unfortunate circumstances even average ("normal") personalities can develop alcoholism.³ In fact, doctors seem to be a high-risk group in regard to alcoholism because of a combination of under- and post-graduate factors. In undergraduate days, during a long period of strenuous training and examinations, heavy drinking is often accepted among medical students as the norm; and later medical practice brings continual excessive emotional and physical demands, frustrations, great responsibilities, with the obvious desire and need to relax after working hours. Under such circumstances even emotionally not particularly "vulnerable"

individuals may during student days become regular drinkers and start excess ("relief") drinking while in medical practice. Unlike Dr Murray's patients, in our experience most doctors' alcoholism seems to be due to environmental factors rather than individual emotional instability.³ Prevention seems therefore an even more important object—such as education of medical students as to the specially high risk of alcoholism among doctors. Referral of more difficult and disturbed psychiatric patients to the Maudsley may have been in part responsible for an atypical and rather unrepresentative composition of Dr Murray's sample, with consequent relatively poor prognosis. The average alcoholic doctor might possibly be deterred even further from seeking help by reading that alcoholic doctors more often than not may suffer from marked psychiatric personality problems. It therefore seems important to stress our findings that most alcoholic doctors show no marked prealcoholic psychiatric abnormalities and stand an excellent chance of all-round improvement and indeed recovery—once they face up to the problem.

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¹ Glatt, M M, *British Medical Journal*, 1968, **1**, 380.

² Glatt, M M, *Journal of Alcoholism*, 1976, **11**, 85.

³ Glatt, M M, *A Guide to Addiction and its Treatment—Drugs, Society and Man*, Lancaster, Medical and Technical Publishing, 1974.

Mobility for the disabled

SIR,—I was interested to read your report (29 January, p 296) of Mr Ennals's assurance for the umpteenth time about the new mobility arrangements for the disabled. For some of my chairbound patients the mobility allowance of £5 a week taxable will be a poor alternative to a private vehicle, albeit the invalid tricycle, now noted to have a high accident rate.

Accidents can, of course, be attributable to faults in a driver as well as a vehicle. Drivers of invalid tricycles have disabilities which, though not making them individually unfit to drive (whatever the accepted criteria are for that), are very likely to make their accident rate as a group higher than that of the healthy population driving ordinary cars. Many of the younger disabled have cerebral palsy and paraplegia and the older ones disseminated sclerosis, rheumatoid arthritis, and other degenerative disorders such as Parkinsonism, osteoarthritis, cardiorespiratory failure, and peripheral vascular disease. Most of these diseases have known neurological effects which can impair sensory pathways, perception, learning, memory, judgment, and motor abilities for co-ordination and reaction speed. Indeed, some of the paraplegics may have been injured in circumstances attributable to their own behaviour. It should require no comment that new drivers of invalid tricycles are particularly prone to accidents.

Those eligible for the mobility allowance must be "virtually unable to walk," this being decided after medical examination. Despite inquiry, I do not know the criteria for this decision. Must the patient be unable to walk from bed to toilet or from home to bus stop? I would have hoped that before an expenditure of over £30m a year was authorised some criteria shown to be consistent should be