immigrant children¹ give a rate of 2.66 per 1000 to be compared with a rate of 0.33 per 1000 from 86 notifications in 263 000 indigenous children.² Far from being lower, the incidence of tuberculosis is eight times higher.

As for tuberculin sensitivity, the annual acceptance rate for BCG protection of newborn infants in hospital, so far as our records go, has only once exceeded 70%.³ Either the 96% BCG acceptance rate for Scottish children in table V is a misprint or the group was unusually highly selected.

The authors report that 11% of "Scottish" children live at a density of over six persons per room, 38% over four persons per room, and 65% over two persons per room (table I), but the conclusion that severe overcrowding is greatest among local Scots is difficult to accept. Not only does this observation contradict the social class gradient but the 1971 census⁴ for the same part of Glasgow reported only 10.6% of houses having more than 1½ persons per room and only 0.1% (four houses) more than six. This again seems to suggest bias in the sample.

The attention attracted by Dr. Goel and his colleagues in the lay press could adversely affect response in a tuberculosis survey already planned for the autumn. It is important that their comments on this letter should be published.

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¹ Strathclyde Education Authority, *Immigrant Children Statistics 1977* (circulated).

² Registrar General's Population Projections for 1977. Edinburgh, HMSO.

³ Annual Reports of MOH, City of Glasgow, 1968-1972.

⁴ Registrar General, *Scotland 1971 Census*. Edinburgh, HMSO.

How effective is measles immunisation?

SIR,—We have just had our first major epidemic of measles since immunisation began. Between 28 March and 12 April this year 82 cases of measles were notified from our practice area (Cambs-Beds border). The parents of eight of these claimed that their children had been previously immunised against measles and our own records confirm this. At least two more children were said to have been immunised previously outside our area, and, although we could not ourselves find documentary evidence to support this, we have no reason to disbelieve these parents. This gives a total of 10 children contracting measles who had previously received measles vaccine.

Assuming the measles immunisation rate for the children of the practice to be 50% and that non-immunised and immunised children were equally exposed, then 72 non-immunised children were exposed and caught measles and supposedly 72 immunised children were similarly exposed and 10 contracted measles—that is, 1 in 7 of children previously immunised when currently exposed contracted the disease. These are crude assumptions but

not too inaccurate, and the general validity of the conclusions remains.

While it is in itself worrying that a significant proportion of children immunised against measles will subsequently contract the disease, we have found equally worrying the difficulty in obtaining authoritative information on the efficacy of measles vaccine. We have contacted the manufacturers of the vaccine, who have referred us to the second report to the MRC by the Measles Vaccine Committee.¹ This deals with the development of the disease in immunised children only in the short term and describes studies carried out 10 years ago. We have also contacted the appropriate community physicians and the Public Health Laboratory Service. These agencies have been polite and very interested but admit to not being able to help us with definitive information on the efficacy in the long or medium term of measles vaccine.

Naturally we have ourselves been asked if we are sure that the disease was true measles. We have been in general practice 20 and 15 years respectively and are well used to old-fashioned measles epidemics. The disease was classical in its course and the children displayed Koplik's spots, although it was clear that many parents had forgotten or not realised what a miserable condition measles is and were surprised by its severity.

With the whooping cough argument still raging unabated it has now become awkward to answer anxious parents' questions on the efficacy of measles immunisation when they know that children can still get the disease despite the injection.

Can anyone tell us, therefore, "How effective is measles immunisation?"

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¹ MRC Measles Vaccination Committee, *British Medical Journal*, 1968, 2, 449.

Must they die?

SIR,—Amoebiasis and malaria between them cause about 10 deaths annually in England and Wales. Amoebiasis also cause considerable morbidity among those who have been wrongly diagnosed as having ulcerative colitis, Crohn's disease, neoplasm, cholecystitis, etc, but have survived the consequent mutilating surgery or treatment with steroids.

Both diseases are easy to treat and are not difficult to diagnose if the diagnosis is considered. These tragedies are a direct consequence of failure on the part of the medical profession; it is up to the medical profession to avoid these mistakes. How can this be done?

Professors B G Macgrath and L J Bruce-Chwatt have for several years been imploring doctors to take a proper history and think of malaria in a patient who has recently been abroad; but these pleas have been of little avail. Patients still die from failure to think of malaria. I have been preaching that amoebic serological tests should be done on all patients with an abdominal or hepatic condition for which no definite diagnosis has been made; patients still die or are mutilated from failure to diagnose amoebiasis.

Both these diseases are "tropical" and as such little attention is paid to them in undergraduate teaching. Even if lectures are given

the students feel that "tropical" diseases have little relevance for them. The most effective single answer lies with the qualifying examination boards. If a question on malaria or amoebiasis were likely in every qualifying examination in medicine, surgery, and pathology the level of awareness of these diseases would rise quickly and dramatically. It will be argued that the syllabus is already so wide that it would not be justifiable to give these diseases such prominence. What other diseases are there in the UK which are so easily diagnosed and so easily treated and from which patients die through failure on the part of the medical profession?

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Rehabilitation work frustrated

SIR,—Production work for rehabilitation of disabled people is obtained in two forms. Either local industry subcontracts jobs or more ambitiously a unit makes and markets its own product(s). In 1961 when this hospital opened, the Birmingham Regional Hospital Board (RHB) advised us to start with subcontract work and replace it gradually by developing our own products. "At the same time consideration should be given to the production of consumer articles to be used in the hospital service."

We followed this sensible advice. In 1964 we started in a very small way to pack surgical dressing packs (CSSD for short) thinking that the market for these would never dry up. Gradually methods improved, sales increased, and the enterprise flourished. Since 1970 two of our four workshops, employing about 80 patients, have done nothing but CSSD; £7000 from patients' surplus earnings have been invested in moving belts, printing machines, and three generations of heat sealers. Last year's turnover figures are typical. Patients earned £20 860 from subcontract and other jobs, while CSSD sales brought in £292 323; this figure includes the labour charge and cost of materials for about 6 million packs (sold unsterile to hospitals throughout the region and autoclaved by them on receipt).

This is now being stopped. The West Midlands Regional Health Authority has built a factory at Wolverhampton called Parkfields to supply these products. Parkfields's prices are higher than ours so we expected that many hospitals would continue to buy from us. To prevent this the RHA decided last autumn to pay hospitals a subsidy amounting to the difference between Parkfields's and our prices. Repeated protests on financial, clinical, and humanitarian grounds have failed. Our MP appealed to the Minister but he declined to intervene.

The regional administrator has given me several reasons for the RHA's policy, including the recommendations of the Cunliffe Committee, the need for "strictest quality control," a wish to standardise and centralise, and "our broader responsibilities for the treatment of other patients within our hospitals." Yet when challenged to say if any of our packs has "ever caused any kind of harm to the patients on whom they were used" he did not reply to this point.

This letter is therefore by way of warning to anyone connected with an industrial unit making CSSD products. If other regions adopt

our region's policy other people's patients will have valuable work taken away from them and a great deal of precious money and expertise will be wasted.

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Anaesthetic waste gas scavenging systems

SIR,—We find a major omission in the article on this subject by Dr R F Armstrong and others (9 April, p 941). This results in the very misleading conclusion in the summary that "the combination of an active system and semiclosed circuitry [was] the most effective."

The combination of passive scavenging with semiclosed circuit was neither tested nor even mentioned. The passive systems were on balance at least as effective as the active systems (in fact two of the three were more effective than either active system) when used with an open circuit. We cannot, therefore, understand why those suitable for use with a semiclosed circuit (that is, all except the coaxial circuit) were excluded from the semiclosed part of the study. There is no reason why passive systems should be any less effective when used with a semiclosed circuit. It would be helpful if the authors could clear up this omission by producing figures for the Enderby and Papworth Penlon systems used in conjunction with a semiclosed circuit in comparable circumstances to those already used for the active systems.

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SIR,—In their report on anaesthetic waste gas scavenging systems (9 April, p 941) Dr R F Armstrong and others compare passive and active scavenging systems in combination with open, semiclosed, and coaxial anaesthetic circuits. They compare values for individual combinations of circuits and scavenging systems against a mean value when no scavenging is used. However, they do not state whether this value, when no scavenging system is used, relates to a combination of anaesthetic circuits or to a single anaesthetic circuit alone. If the latter, to which does it refer?

Since their results have shown that pollution levels differ when different anaesthetic circuits are used it is important to know what the pollution level with no scavenging is for each individual anaesthetic circuit.

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* * * We sent copies of the above two letters to Dr Armstrong and his colleagues, whose reply is printed below—ED, *BMJ*.

SIR,—It seems from the letters of Drs Bethune and Collis and Drs Wedley and Broadbent that the purpose of our paper was not entirely clear. It was not our intention to make a consumer guide to exhaust systems. This would have had to include, for example, study of cost, reliability, and difficulty of installation as well as many more control measurements and comparisons along the lines suggested

by Drs Bethune, Collis, Wedley, and Broadbent. What we did do was to study a number of currently available waste gas scavenging systems, under conditions relatively comparable to normal clinical use, with intensive monitoring for leaks, with respect to halothane.

The results show that if 1 part of halothane per million is taken as the acceptable upper level for atmospheric pollution,¹ then only the active system supplied by Draeger was effective, the main reason being that this was the only system which did not leak significantly from areas other than the exhaust valve.

Drs Bethune and Collis need not feel unduly anxious about our apparent neglect of the Enderby and Papworth-Penlon systems with a semiclosed circuit. Although no measurements were made with these particular combinations, we would agree with their inference that these systems might well provide effective scavenging. However, they will be no better than any other if the anaesthetic system to which they are attached has leaks of its own.

Our main point remains that the use of any scavenging device, without careful and probably continuous monitoring for leaks from the whole system, is unlikely to maintain the recommended¹ low levels of atmospheric pollution in operating theatres. In our view this observation should be taken into account by anaesthetists who currently find themselves under pressure from the Department of Health and Social Security and other bodies to "do something about pollution."

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¹ Whitcher, C, *et al*, *Development and Evaluation of Methods for Elimination of Waste Anesthetic Gases and Vapors in Hospitals*. DHEW publication No 75-137. Washington, DC, US Government Printing Office, 1975.

SIR,—The description by Dr R F Armstrong and others of anaesthetic waste gas scavenging systems (9 April, p 941) provides the old recommendations of the National Institute for Occupational Safety and Health (NIOSH). The most recent recommendation is contained in their criteria document and recommends levels for nitrous oxide below 25 parts per million (ppm) and halogenated hydrocarbons below 0.5 ppm. The documentation for the reliability of the Leakmeter used does not include direct measurements in this range, only an extrapolation from a calibration graph determined by testing greater concentrations.

The criteria document recommends the control of all anaesthetic agent pollution. Nitrous oxide is "piped" to and through the anaesthesia machine before halothane is introduced into the machine circuit. Nitrous oxide leaks from high-pressure sources can grossly contaminate a room because of the driving force and this pollution is likely to be constant whether an anaesthetic is being administered or not.

The effective control of ambient pollution necessitates a thorough daily testing for gas-tightness of each machine and accessory equipment and piping. The article did not describe what testing procedures were used to identify and subsequently correct machine or system leaks. Only the Draeger machine with semiclosed circuit using an active scavenging

system met the proposed NIOSH criteria. The difference in effectiveness between the Draeger and BOC active systems (40 l/min flow versus 25 l/min flow) may represent only the differences in gas integrity of the two pieces of anaesthetic equipment. We do not feel that such small differences in measurements made on an essentially uncalibrated piece of equipment can represent a recommendation.

The fewer the fresh air changes in each operating room and the less "active" the scavenging system, the more important the anaesthetist's compliance with good pollution control procedures becomes. Passive systems are difficult to use since the driving power, the positive force of patient expiration, and circuit overflow also tend to propel the pollutants into the theatre. The active systems reduce this likelihood by exerting a combination of flow and negative pressure that effectively captures the gases. While tending to be more effective in keeping operating rooms pollution-free, they are very expensive in terms of energy cost.

Personal experience in correcting pollution problems in operating theatres indicates that only a two-pronged approach can effectively solve the problem. Each anaesthetising location needs to be ventilated with fresh air at 10-20 or more room air changes per hour as well as to be scavenged effectively. Only the ventilatory system can control the pollution introduced by unresolvable technique and equipment factors. In fact, the greater the ventilation flow rate, the more likely a passive system or low-flow active system can be effectively used. The best scavenging system used without an adequate ventilation system will not accomplish the NIOSH recommendations.

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Polymyalgia arteritica

SIR,—There are two factual errors in your leading article on polymyalgia arteritica (23 April, p 1046) which require correction if future generations are not to be confused. The first is that Jonathan Hutchinson (1890)¹ has many years' precedence over Horton (1932)² in describing temporal/cranial/giant-cell arteritis, although it is not unlikely that Ali Ibn Isa,³ born in Baghdad in AD 940, deserves precedence over both. He noted a relationship between inflamed arteries and visual symptoms not only in migraine but also in "affections showing heat in, and inflammation of temporal muscles. These conditions may terminate in loss of sight."

The second error is the statement that loss of vision in the disorder is due to occlusion of the central retinal artery when in fact it is the ophthalmic artery. The appearance of the fundus in the temporal arteritic phase of giant-cell arteritis bears no resemblance at all to that of central retinal artery thrombosis, and from personal observation of several hundred cases of giant-cell arteritis/polymyalgia arteritica over 27 years I have yet to see one with central retinal artery occlusion. It would be rash to say it never occurs, but this experience shows that it must be very rare. On the other hand I have observed central retinal venous thrombosis in association with giant-cell arteritis about four times.