and in the case of the younger men the financial penalties imposed on them if they resign before the end of the three years' probationary service are too great for their slender resources.

Those who intend joining the service must know that there is grave discontent among medical officers in Malaya and that this discontent is amply justified. They must also realize that they can place no trust in the truth of statements concerning conditions of service in the Colonies made to them at their interview in London. These are not the complaints of an inexperienced person who takes badly to service conditions, for I have already had six years with the Navy and am well used to the discipline of that Service. Nor are they those of one who dislikes hard work in a hospital. They are the bitter complaints of a man who resigned after six months in the Malayan Medical Service and who has seen his plans for the future destroyed by the deliberate misrepresentations of a supposedly responsible Government Department.—I am, etc.,

Singapore.

R. O'KANE.

* * The Colonial Office informs us that a commission to investigate salaries in the Malayan Medical Service has now arrived in Malaya.—ED., *B.M.J.*

Tuberculosis and the N.H.S. Act

SIR,—We may expect to see the personnel of the regional boards published at any moment, and as soon as appointed they will have to get to work on the new organization due to operate from April 1, 1948. We also note that the Minister of Health himself is to give an address on July 8 at the Commonwealth and Empire Health and Tuberculosis Conference, arranged by the National Association for the Prevention of Tuberculosis, on the "National Health Service Act and its Effect on Tuberculosis Schemes."

Tuberculosis, because of its effect not only on the patient but on the community, presents special problems and difficulties, as is generally admitted; we note that the Minister of Health and Minister of National Insurance have accepted the position that pulmonary cases will qualify for extra benefits, and the Ministry of Labour is planning special workshops for the tuberculous. No scheme for the prevention and treatment of tuberculosis can ever be efficient and effective unless the family is regarded as the unit. If separate medical staffs undertake separate parts of what should be a unified tuberculosis scheme, then we shall surely see return a state comparable with the pre-Astor-report days.

Leading officials of the Ministry of Health have stated that it is the full intention to continue the best features of efficient tuberculosis schemes. How, then, can we ensure within the framework of the new Act the greatest possible integration of the several components which ought to constitute a workable and successful regional organization? May I set down my views to achieve this end?

1. The Minister of Health, after consultation with central health services council, should have a tuberculosis advisory committee to advise on policy and to provide technical guidance on tuberculosis, such course being permissible by Section 2 (3) of the Act.

2. For the control and direction of the day-to-day tuberculosis work of diagnosis and treatment there should be appointed by each regional board a tuberculosis committee to be assisted by a regional tuberculosis officer and staff. The committee could take the form of (a) selected members of the regional hospital board, with co-opted persons of experience in tuberculosis, or (b) an advisory technical body of mainly tuberculosis officers and medical officers of health, or (c) in large regions, both (a) and (b)—that is, a tuberculosis committee aided by a technical body.

3. The tuberculosis medical staff for each region should consist of one or more graded medical teams with clerical assistance and tuberculosis health visitors who would assist in the dispensary work and bring a first-hand knowledge of the family circumstances and conditions and contacts—so important in a scheme based on persuasion. Each team could be given responsibility for an area containing several hundred thousand population, and preferably coextensive with one or two hospital management committee areas. The teams should perform both dispensary and sanatorium duties, work in the closest relation with the general practitioners, examine contacts, and be given the definite duty to assist the medical officers of health of county and county borough councils in care work and in preventing the spread of infection. Each team should have a

register of all the tuberculosis cases in their area, and generally hold the tuberculosis service together so that they would always know what is happening to the patients, both pulmonary and non-pulmonary.

4. Throughout the country there are many small tuberculosis institutions; it is the intention gradually to eliminate these as separate units and to provide equivalent accommodation as part of the large and improved general hospitals. They may take a long time. Meantime how should the day-to-day management of the existing sanatoria be effected? I suggest that they and the tuberculosis dispensaries be taken as a group in each region and administered by the regional tuberculosis committee, which could and should co-operate where advantageous with hospital management committees in the region.

The proposed transfer of the whole hospital and specialist services on April 1, 1948, will involve (along with general medical, dental, pharmaceutical, ophthalmic, etc., services) a considerable feat of organization; in the event of delay, and if the date fixed cannot be amended, I suggest that the county councils and county boroughs be asked to continue by contract the tuberculosis service on behalf of the regional boards until the transfer can be made on a well-planned basis.—I am, etc.,

Church Stretton, Shropshire.

G. LISSANT COX.

Intra-group Transfusion Reactions

SIR,—One of the problems in connexion with iso-sensitization to the Rh factor that still awaits clarification is why transfusion reactions due to this cause were not recognized till 1939, when Wiener and Peters encountered three cases following transfusions of blood of the homologous groups. It cannot be said that opportunities for iso-immunization were not frequent. Previous to the discovery of liver therapy for Addison's anaemia repeated blood transfusion was the only effective treatment. It is seen from the reports of the British Red Cross Blood Transfusion Service relating to this period that approximately one patient in five that was transfused was a subject of pernicious anaemia.

The demonstration of anti-Rh agglutinins by the rapid slide test of Diamond and Abelson would seem to throw some light on the cause of the delay in the recognition of intra-group transfusion reactions. In this test, oxalated undiluted blood is used instead of a dilute suspension of red cells employed in the tube-agglutination test. The use of a 2% suspension of red cells in routine blood grouping and cross-matching has now become the standard technique in every blood bank and laboratory. The advantages claimed for this technique are that it helps iso-agglutination to develop promptly by providing optimal conditions, and also prevents errors due to false agglutination. Concentrated blood, on the other hand, tends to mask a weak reaction.

It will be remembered that, previous to the adoption of the tube method, whole blood or defibrinated blood was almost exclusively used for blood-grouping and cross-matching purposes, and that the tests were performed on a tile or slide. Very often the drop of blood was transferred to the drop of grouping serum (or recipient's serum) direct from the finger-prick by means of a platinum loop. I saw this rapid test done on a porcelain tile by Dr. H. F. Brewer, medical officer of the British Red Cross Blood Transfusion Service, at St. Bartholomew's Hospital, London, in 1932.

It will be seen that the Diamond-Abelson test for Rh iso-sensitization does not appreciably differ from the blood-grouping and direct-matching technique followed in the earlier days. Is it possible that incompatibilities were encountered and donors, though of the homologous blood groups, were rejected, although the true explanation for the anomalous reactions was not known? The answer would seem to be in the affirmative. In a plea for a national blood transfusion conference made by P. L. Oliver, founder and honorary secretary of the British Red Cross Blood Transfusion Service (*Journal*, Nov. 21, 1936, p. 1032), one of the problems suggested for consideration was "cross-grouping of donor against patient." The following statement is found under this heading. "During the past eight months 78 donors have been found to be incompatible against patients of their own group. This has been found especially prevalent in Group I (Moss)." Whether they were all due to subgroups or to some other cause it is difficult to say. But it is clear that intra-group incompatibility was a problem for serious consideration. It was naturally a problem to the service rather than to the clinicians.

There can be no doubt that the change in the technique from the use of whole blood to diluted blood was directly respon-

sible for bringing down the sensitivity of the direct-matching test by almost one-half. It was apparently not suspected that the use of dilute blood would interfere with agglutination of the red cells sensitized by the "blocking" or "incomplete" antibody.

I have been prompted to point out the similarity between the Diamond-Abelson test and the direct-matching test as it was performed in the 'thirties as a possible explanation for the non-recognition, or perhaps non-occurrence, of intra-group transfusion reactions due to the Rh factor and not to bring any discredit whatever on the value of the test. Indeed, to us in India, where anti-Rh serum is so hard to obtain, the test has been a real boon as it enables the detection of intra-group incompatibility in the absence of anti-Rh serum and also helps to select a compatible donor. And that is what the clinician is interested in.—I am, etc.,

Office of the Director-General,
Indian Medical Service,
New Delhi.

K. S. RANGANATHAN.

Retrodisplacement and Fertility

SIR,—Whenever a man states that there is "no shadow of doubt" about an assertion one may know that even he suspects its truth. Dr. Bethel Solomons (April 5, p. 465) asserts that "There is not the slightest doubt that retrodisplacement of the uterus is a cause of sterility." Had he stated that retrodisplacement is frequently associated with lowered fertility there would be less reason to disagree with him.

Some people with retroussé noses have nasal obstruction, but one should not assert that retroussé noses cause nasal obstruction. On the other hand damage to the nasal septum may produce both nasal obstruction and a retroussé nose. It will not cure the nasal obstruction for a plastic surgeon to build a Roman nose, and the obstruction is usually relieved without altering the curve of the external organ.

Retroversion is one of the normal positions of the uterus, though less common than anteversion. Lowered fertility is a frequent concomitant of uterine hypoplasia, and the hypoplastic uterus is very frequently either acutely retroflexed or acutely anteverted; but it is a bold statement that the position of the uterus causes the failure of conception. To put the uterus in another position will not cure its imperfect development, and as a matter of practical experience does not cure infertility.—I am, etc.,

Newcastle-upon-Tyne.

FRANK STABLER.

Reiter's Syndrome

SIR,—In the interesting annotation on Reiter's syndrome (April 12, p. 495) it is noted that this condition is apparently confined to young adult males.

Two cases occurring in women have been described. Details of one are given by Dr. A. Touraine under the title of "pseudogonococcie entéritique" (*Ann. Derm. Syph.*, Paris, 1946, 6, 687). The other case, described by W. Lever and G. M. Crawford (*Arch. Derm. Syph.*, Chicago, 1944, 49, 389), is cited by A. Touraine and A. Ruel in a very comprehensive survey of the subject (*Ann. Derm. Syph.*, Paris, 1946, 6, 61).—I am, etc.,

London, S.W.1.

JAMES MARSHALL.

SIR,—I read in your annotation (April 12, p. 495) that Reiter's disease is apparently confined to young adults.

It might be of interest to report that three months ago I attended a man of 58 who had this disease. It began with painful haematuria following in three days with bilateral conjunctivitis, and two days later an arthritis of the right ankle. The urethritis cleared in a week and the conjunctivitis in five days, but the arthritis became increasingly painful, and both knees were affected ten days from the onset of the original symptoms. Eventually his only relief was from diathermy and spa treatment. This man had no venereal history, nor had he ever had any dysentery. Four years previously he had had arthritis in the right knee, and presumably this had left him susceptible to a recurrence of arthritic symptoms.—I am, etc.,

Hales Owen, Worcs.

G. T. NEWTON.

Curare

SIR,—Having followed the recent correspondence on the condition of shock and respiratory depression associated with the use of curare, commencing with a letter by Dr. Massey Dawkins (Jan. 18, p. 111), with considerable interest, it is felt that the following points are pertinent.

Respiratory depression caused by anaesthetic agents, whether due to their action on the respiratory centre or on the respiratory musculature, is associated, first, with an increase in the CO₂ tension and, secondly, with a decrease in the O₂ tension. To understand this it is necessary to realize the underlying physiological facts. The optimum number of respirations for elimination of CO₂ with a tidal air of about 500 ml. is approximately 16 per minute in a person having a normal basal metabolic rate. However, the amount of oxygen available for normal tissue respiration is four times the value necessary; so by this it can be seen that the important factor in respiratory depression is CO₂ accumulation and not anoxaemia. CO₂ accumulation when about 7% causes a rise of blood pressure through its central action on the vasomotor centre; at lower concentration the CO₂, having a peripheral dilating effect on the arterioles, causes the central effect to be counterbalanced.

Some interesting work has recently been published by R. D. Dripps in America (*Anesthesiology*, 1947, 8, 15), where he has shown that a fall in blood pressure following cyclopropane anaesthesia is associated with a high CO₂ tension in the blood during operation. This also is probably the mechanism of the condition of shock occurring after the use of curare where marked respiratory depression has occurred without adequate CO₂ elimination. In using curare I have made a practice of not administering it within half an hour of the expected termination of an operation, but if increased relaxation is required I increase the concentration of the anaesthetic agent I am using, and so avoid causing respiratory depression lasting from 15 to 30 minutes.

With this CO₂ accumulation theory in view I do not ever add CO₂ to the anaesthetic mixture, but if there is not a good respiratory exchange at the closing stages of the operation I give a few minutes of "aided" respiration by pressure on the reservoir bag, having first "blown off" the anaesthetic gases.

Since having followed this routine I have had no cases of shock following curare administration, except on one occasion when I found I had been using non-acting soda-lime in a closed-circuit apparatus.—I am, etc.,

Leamington Spa.

GEOFFREY L. WAY.

SIR,—In his letter dealing with the post-operative anoxaemia allegedly attributable to the use of curare, Dr. W. M. Maidlow (April 5, p. 466) invokes total carbon dioxide absorption in closed circuits as a more culpable factor. In support of his contention that absorption should be but partial or intermittent he asserts that "the carbon dioxide in the circuit causes dissociation of oxygen from oxyhaemoglobin in the tissues." The italics are mine, and I would submit, Sir, that what promotes the dissociation of oxyhaemoglobin in the tissues is the carbon dioxide tension in the tissues. This tension is normally higher than that in the alveoli. Under resting conditions the relative figures are 46 and 40 mm. Hg. If this normal carbon dioxide tension gradient is reversed, by either incomplete absorption or the addition of carbon dioxide artificially to the inspired gases, it becomes easier for the oxyhaemoglobin to dissociate in the lungs than in the tissues, and the blood leaves the lungs having secured rather less oxygen than it would otherwise have done. In fact the tissues have not been "given the benefit" which was intended. Left to themselves the tissues will by their own respiration build up a local carbon dioxide tension conducive to oxyhaemoglobin dissociation, and we can raise that local tension only at the expense of a similar rise in the alveolar tension—the old dilemma of the swings and the roundabouts.

It is true that any patient in first- or second-plane inhalation anaesthesia will breathe less deeply if he is put into a circuit with total absorption, and if the atmosphere he was breathing was just sufficient to maintain oxygenation he will now become anoxic. But since it is the usual practice to use oxygen-enriched atmospheres in closed circuits this situation does not arise during