from its cavity. The sounds tend to be lower in pitch than when produced in air.—I am, etc.,

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M. J. BALL.

Tuberculosis in Developing Countries

SIR,—As one engaged in tuberculosis work in a developing country for nearly 20 years, I have great pleasure in joining Dr. N. Islam of Pakistan (15 February, p. 429) in congratulating Dr. Wallace Fox on his excellent paper on realistic chemotherapeutic policies for tuberculosis in developing countries (18 January, p. 135).

While admitting that treatment in hospitals under supervision is undoubtedly the best, I cannot agree with the views expressed by Drs. William J. Bell and P. P. Brown (22 February, p. 501) that control can be achieved only by a form of therapeutic detention for which hospital beds must be made available. We have about 5 million patients in the country, of whom about 2–3 million are infectious at any point of time, as against 35,000 beds we have for these patients. It is obviously impossible to provide hospital beds even for a fraction of these millions of patients not only now but also in the foreseeable future. Their suggestion "the need is for simple shelters built of local materials at village levels, where patients may rest or work under control" is a very sound one. But to provide accommodation for all these patients even in kucha buildings is impracticable and the only alternative is to organize mass treatment of the patients in their own homes and admit only such patients who cannot be treated at home owing to complications, drug resistance, or compelling socio-economic reasons. For this purpose expansion of hospital beds and provision of cheap isolation-homes are necessary. I am in full agreement with their views that "... if therefore uncontrolled out-patient chemotherapy becomes the order of the day, we can expect further deterioration of an already lamentable situation." But then, what has been recommended is not "uncontrolled out-patient treatment" but a well-organized domiciliary treatment service. Experience shows that it is quite practicable to have such organizations, and sputum conversion can be achieved in 80–90% of patients so treated,¹ provided adequate quantities of drugs are available.

With regard to drug resistance, the situation in Hyderabad is no better than that in Ghana. For instance, 15% of the freshly diagnosed, previously untreated patients had cultures resistant to isoniazid and 4% to streptomycin in 1959–60²; and this had increased to 21% and 8%, respectively, in 1963.³ 84% of 452 chronic patients undergoing treatment for about 6 years had cultures resistant to isoniazid—45% to streptomycin and 85% to one or both drugs.³ Failure on the part of the patients to take the drugs could undoubtedly be one of the causes for this high rate of drug resistance, but domiciliary chemotherapy in those years was mainly with isoniazid alone,³ and it is conceivable that drug resistance could have been substantially reduced if all three drugs had been given to the patients for at least a period.

There is just another point: 52% of the new patients seen at our centre during Janu-

ary to August 1963 had already had private treatment, though all came from very poor segments of the city population and 43% of them had initial cultures resistant to one or both drugs—40% to isoniazid and 24% to streptomycin. This suggests that there is need to have some sort of control over the manufacture of improper drug combinations and the sale of antituberculosis drugs to prevent their indiscriminate use and breeding of drug-resistant strains.—I am, etc.,

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Treatment of Thyrotoxicosis

SIR,—We read with great interest the article on thyrotoxicosis treated by surgery or ¹³¹I with special reference to the development of hypothyroidism, by Dr. M. Green and Professor G. M. Wilson (18 April, p. 1005). The comparison between the two methods clearly shows a much lower incidence of hypothyroidism after surgery, with hypoparathyroidism and recurrent laryngeal-nerve damage on the debit side with the operative method of treatment. The following considerations are pertinent in our view, in making any comparison:

(1) The advantages of non-hospitalization are claimed for ¹³¹I. It should be remembered, however, that the management of thyroidectomy has changed considerably. The euthyroid patient can be admitted on the pre-operative day, and the post-operative period is generally four to five days.

(2) Isotope therapy can only be carried out in specialized and well-staffed units—mainly in teaching hospitals. Surgery, on the other hand, can be and is most effectively done in hospitals throughout the country.

(3) Isotope therapy is expensive in man-hours and equipment with a follow-up system, which adds to the cost. The possibility of hypothyroidism for years after the initial treatment necessitates protracted observation of the patient on this account.

(4) Our own experience of over 1,250 personal thyroidectomies for thyrotoxicosis suggests that hypothyroidism after surgical treatment is usually manifest in the first year. An annual follow-up of patients after this would suffice.

(5) Perhaps the best of all surgical results are in the so-called "thyrocardiacs." Many of these have nodular goitres, in whom it is generally agreed that ¹³¹I is difficult to gauge.

(6) The delay in achieving the euthyroid state with ¹³¹I therapy and the fact that 49% of patients in Green and Wilson's series required more than one dose almost condemns it on the basis of loss of man-hours and costing. The effect on the home in female patients should also not be ignored.

(7) One of us (W. M.) has done a tanned red-cell test in recent years on every case and has found great variation in the results repeated over the course of a few months. Clinical features, laboratory tests, and histology rarely corresponded and it was not possible to spot the thyrotoxic phase of Hashimoto's disease.

(8) While surgery has virtually no mortality, the morbidity from its complications is less by far than a 40% incidence of hypothyroidism over 10 years observed with ¹³¹I. The myxoedema rate after surgery in our series is 2–3%. Unilateral recurrent nerve injury is often temporary. It occurs in 2–3% and produces virtually no disability. Bilateral recurrent nerve injury has not occurred. The incidence of clinical hypoparathyroidism after operation is 2–3%. Recurrent thyrotoxicosis after operation has occurred in less than 1% of our series.

We are of the opinion that the treatment of the thyrotoxic patient by surgery has many advantages. In comparison with ¹³¹I it is more concise and predictable, requires less overall supervision, and in the end may well be less costly.—We are, etc.,

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Hypertension with Monoamine Oxidase Inhibitors

SIR,—Your leader (7 March, p. 578) and the subsequent correspondence relating to this subject have prompted me to recall some early experience with iproniazid ("marsilid"). This drug was first used in this country at the London Hospital in 1952 for the treatment of tuberculosis.¹ The remarkably wide range of its side-effects was at once apparent. Daily records of these effects were made in 50 in-patients over a period of four months' treatment and the details of 18 different types of toxic reaction were subsequently published.² Your reference to "recent reports" (in 1963) of the hypertensive effects of iproniazid suggests that the earlier experience gained during the treatment of tuberculosis is not widely known. An account of hypertensive attacks due to iproniazid was first published ten years ago,³ when the following description was recorded:

"Four patients (8%) treated with Iproniazid experienced attacks of a most distressing nature. These usually occurred when they first lay down on their beds during the early part of the evening. The attack presented with palpitations and a sense of intense anxiety, followed by a rushing throbbing sensation in the neck, and culminating in a severe thumping occipital headache associated with flushing of the face and profuse sweats. Two patients vomited during the attack and a third complained of blurring of vision. In each case, the symptoms subsided within half to one hour. Examination revealed an extremely anxious and restless patient with a tachycardia and hypertension. Blood-pressure readings before, during and after the attack are available for three of those patients and in each case it was significantly raised during the attack." (Paradoxically, hypotension with postural syncope is a more common reaction to iproniazid and occurred in eight of the same series of 50 patients.)

The possible application of iproniazid in psychiatric problems was also recognized in 1952. A small group of patients in a mental hospital was treated, with improvement in their appetite, weight, and general condition.²

Unfortunately iproniazid proved too toxic to justify its use in tuberculosis, but it would be of some comfort to know that the experience recorded in these original trials was still