Protein-bound Iodine Levels in Pregnancy

SIR,—A letter from Dr. F. J. Pick (21 November, p. 1329) included the statement that estimation of the serum protein-bound iodine (P.B.I.) is "very helpful . . . in detecting thyroid disorders in pregnancy." This claim must be very seriously questioned. Pregnancy causes a marked elevation in the thyroxine-binding capacity of the serum thyroxine-binding globulin (T.B.G.).¹ As a result it is not at all uncommon to find P.B.I. levels that are at least twice the normal value in euthyroid, pregnant women.^{2,3} This rise occurs at about six weeks following conception and is then maintained throughout pregnancy.¹

The diagnosis of thyroid disease in pregnancy may, in fact, be extremely difficult to confirm by any of the standard tests of thyroid function. The increase in T.B.G. may invalidate not only the P.B.I., but also the butanol-extractable iodine (B.E.I.) level, the erythrocyte or resin uptake of labelled tri-iodothyronine, and the more recently available estimation of serum total and "free" thyroxine. The B.M.R. will be physiologically elevated, and, because of the potential hazard to the foetus, tests of thyroid function utilizing tracer doses of radio-iodine are usually considered out of the question.

Hyperthyroidism or myxoedema in pregnancy may thus have to be diagnosed mainly on clinical grounds alone. The P.B.I. value is only reliable if it can be shown that the T.B.G. capacity is normal. This may be directly measured in some centres,³ but may be inferred with some confidence if the erythrocyte uptake of tri-iodothyronine is in the normal range.⁴ The limitations of this latter test must be constantly borne in mind, however.⁴

Dr. Pick's letter prompts me to add three further comments concerning P.B.I. determinations:

(1) Although the P.B.I. level may indicate latent hypothyroidism, it is also true that clinical hypothyroidism may be present before the P.B.I. has fallen into the hypothyroid range. In such cases, if other tests suggest that the patient is myxoedematous, then the clinical response to thyroid hormone replacement may be the best diagnostic "test."

(2) In large hospitals particularly, great care must be taken to ensure that blood withdrawn from patients for P.B.I. determination is placed in scrupulously clean test-tubes, preferably new. Unless this precaution is taken, it is not unlikely that a previous blood sample may have been taken from a patient with gross organic iodine contamination following some radiographic procedure. A significant amount of this iodine may remain even on washed glass and thus contaminate the P.B.I. sample.

(3) The oestrogenic component of the oral contraceptives may be capable in some cases of elevating the T.B.G. capacity and thus of increasing the serum P.B.I. If the P.B.I. is to be determined on the serum of a woman of child-bearing age she should be specially questioned as to whether she is taking oral contraceptives. If the diagnosis of thyroid disease is seriously in question then these pills must be stopped for at least 10 days before the P.B.I. can be relied on as being unaffected. Similar precautions must, of

course, be taken with any patient receiving synthetic oestrogens.⁵—I am, etc.,

London W.5.

BRIAN WEBSTER.

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Toxic Insecticides

SIR,—The use and abuse of toxic insecticides persist, and it is partly the responsibility of the medical profession to see that they are correctly applied and cases of poisoning reported. Recent personal experience of their abuse last summer prompts me to draw the attention of doctors to their effects on the human nervous system. Investigation of a recent neurological case showing central- and peripheral-nervous-system damage to a worker in the strawberry fields led me to discover that organic phosphorus compounds, organic mercurial compounds, and chlorinated hydrocarbons were being applied by a particular grower quite haphazardly when the crop was fruiting and about to be picked.

It is quite obvious that many other growers fail to appreciate the toxicity of the chemicals they use and fail to comply with the manufacturer's instructions and warnings not to apply toxic compounds to ripe fruit, particularly in dry seasons. It is useless for the Ministry of Agriculture to claim that voluntary control of their application is needed to prevent possible harmful long-term and short-term ill effects to human life. Their danger to bird life has been proved.

Dr. Jarrett, of Dorchester, has recently given me details of two cases of polyneuritis almost certainly related to the abuse of dieldrin as a sheep dip in which the material had been handled in strong concentration without precautions. The "Smarden Affair" was a shock to the public, and it was lucky there were no human repercussions. The poisoning of domestic animals eating the flesh of a horse which had died as a result of eating fluoroacetamide emphasized the danger of transmission of this type of poisoning from one animal to another. Have we considered carefully enough the transmission of dieldrin to man from sheep treated with this indestructible insecticide as a sheep dip? Furthermore, I believe the organic phosphorus insecticides are now being applied to cattle to kill warble flies. Are we sure this is entirely safe? The late Rachel Carson did a service to us in reminding people of the hazards of insecticides in America, and, although she overstated her case, it would be wise for us to take her warning seriously. The medical profession must not be lulled into a false sense of the harmlessness of insecticides by believing entirely what is stated by the manufacturers. We have no idea, either positively or negatively, of the effects of their prolonged use on man. Extreme vigilance to correlate obscure illness which may be associated with these compounds is necessary.

I am particularly interested in hearing about cases of polyneuritis related to ex-

posure to insecticides, particularly of the chlorinated hydrocarbon group. It is possible that some people may be hypersensitive to these compounds, particularly if they are misused, but it is difficult to collect firm evidence. If any readers of your journal could supply me with particulars of probable cases I would be most grateful.—I am, etc.,

79 Pembroke Road, A. M. G. CAMPBELL.
Clifton,
Bristol 8.

Giant Follicular Lymphoma of the Spleen

SIR,—Dr. R. A. Hickling (26 September, p. 787) reported on four cases of giant follicle lymphoma "apparently cured" 13, 10, 6, 4, and one year after splenectomy. We would like to give briefly the history of a woman aged 45, in the year 1946.

Because of splenomegaly she underwent a splenectomy, and a giant follicular lymphoma was found. Post-operative localized x-ray therapy was given. Up to 1962 she felt well. At that time a pre-auricular lymph node appeared. On clinical examination and laboratory test no other abnormality was found. For technical reasons, surgical excision was impossible, and therefore local x-ray therapy was given and the node disappeared. In 1963 an inguinal lymph node was found. This was excised and interpreted as giant follicular lymphoma transforming into lymphosarcoma. The patient has now generalized disease.

We see that 16 years after splenectomy activity of the disease returned. A similar phenomenon has been described in breast-cancer patients in whom local recurrences appeared up to 30 years after mastectomy. We had one patient who had local recurrence 13 years after the mastectomy.

The reason for this quiescent period is of course not known. In view of this and the suggestion in the literature¹ that a malignancy in one specific organ may imply increased susceptibility of another specific organ to malignant neoplasm we would suggest careful follow-up of all patients who have once had a neoplasm.—I am, etc.,

Oncological Department, E. ROBINSON.
Hadassah Medical Organization,
Jerusalem.

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Producing Muscle Movement in Paralysis

SIR,—This preliminary report is intended to establish a date that it is hoped will be of later interest.

It has now been proved possible (and it has been recorded on film) to take an electrical impulse percutaneously from a contracting muscle in the body, to pass the impulse through appropriate circuits and to pass it back percutaneously to one or several other muscles, thereby producing synchronous effective contraction. It is thus possible to produce and maintain contraction in selected muscles in the same individual (or in another individual). Some uses of this technique, when further developed, it is hoped will include, in paraplegic and tetraplegic cases, voluntary muscle movement below transverse cord lesions synchronously with selected muscles above the lesion. For example:

(1) Trapezius, or a segmentally lower muscle, voluntarily operating abdominal and