Correspondence.

"Audi alteram partem."

TREATMENT OF MALIGNANT DISEASE BY A DIET DEFICIENT IN FAT-SOLUBLE VITAMIN A.

To the Editor of THE LANCET

SIR,—It may perhaps be of interest to supplement Dr. Stanley Wyard's report in THE LANCET for April 29th by appending the list of foods allowed and to be avoided respectively, which I drew up, with the kind help of Prof. Gowland Hopkins, for the purposes of our investigation.

Apart from the question of the possible influence of such a dietary on malignant disease, the investigation, of which the work at the Cancer Hospital has formed a part, constitutes, so far as I am aware, the first attempt to estimate the effect on the resting human subject of a diet which, though markedly deficient in the fat-soluble A vitamin, is otherwise sufficient in amount, well-balanced, free from monotony, and of a palatable nature.—I am, Sir, yours faithfully,

May 4th, 1922. S. MONCKTON COPEMAN.

SUGGESTED CANCER DIETARY.—Deficiency of "Growth-Accessory" Vitamin (Fat-Soluble A).

ALLOW.

White bread, or toast.	Root vegetables (except carrots).
White flour.	Tomatoes, tinned.
Margarine (free from animal fat).	Well-boiled cabbage. The inner whitish portion. The outer green leaves should be rejected.
Lard.	Celery—raw or cooked—avoiding any green portion.
Suet, free from animal fat (Mapleton's "Nutter").	Pea-flour (dried split peas or lentils).
White fish (if fried, use olive or other vegetable oil).	Mushrooms.
Tinned meats (avoid fat, so far as possible).	Fruit of all kinds, tinned or fresh, cooked or uncooked, except bananas.
Meat extracts, Bovril, Oxo, &c.	Potatoes (baked or boiled in skin, or fried in vegetable oil).
Marmite (yeast extract) "flavoured."	Bird's or other custard powder.
Bacon, ham.	Tea, coffee, cocoa.
Rice, ground rice, cornflour, tapioca, sago, semolina.	Spirits, light wines, mineral waters, beer, stout.
Macaroni and its products.	
Milk (separated, dried) or "Solac."	
Cheese (skim-milk).	
Sugar, treacle.	
Jams, marmalade.	

AVOID.

All kinds of brown or whole-meal bread.	Porridge.
Eggs (white of egg may be used if desired).	Green vegetables.
Butter.	Salads—e.g., lettuce, &c., and other uncooked vegetables, except as above.
Fresh meat (unless in slices free from fat, and fried in "Nutter" fat).	Fish (oily): mackerel, eel, herring, red fish of all kinds (salmon, red mullet, &c.).
Cream, new milk.	

NASAL DIPHTHERIA AND FOREIGN BODIES.

To the Editor of THE LANCET.

SIR,—May I add the notes of one further case to those described in THE LANCET of May 6th?

Geo. H., aged 5, was brought to the school clinic on 10/10/17 with a history of a bad smelling nasal discharge lasting two years. As the nasal swab showed diphtheria bacilli, although the patient was apparently in good health, he was admitted to the fever hospital on Oct. 11th. It was found that a bad smelling yellow discharge was present which came chiefly from the left nostril. On Oct. 16th a swab was submitted for examination to the Lister Institute, and the organism was found to be virulent to guinea-pigs and to have the cultural characteristics of the diphtheria bacillus. Despite local treatment the nasal swabs remained positive and the boy was discharged at the request of his parents on Feb. 7th. The swabs remained positive on March 5th. A few days later the mother whilst syringing the nose displaced a button which she brought in triumph to the Health Office. The nasal discharge cleared up thereafter, and two further swabs taken later were negative.

For many years I have been impressed by the frequency with which swabs from superficial sores in diphtheria patients give positive results. Also it

has always been common knowledge that swabs from the nasal septa of patients suffering from *one-sided irritating, it may be blood-stained*, nasal discharge frequently show diphtheria bacilli. It is for these reasons and because of their high infectivity that in grouped diphtheria in Brighton I first pick out and swab contacts suffering from fibrinous rhinitis and superficial sores, and disregard healthy contacts and those with non-irritating nasal discharge.

It would seem that the conditions present in the superficial sore are favourable to the growth and multiplication of the diphtheria bacillus; also that when there is a source of irritation in the nose, whether produced by picking by a foreign body or otherwise, similar favourable cultural conditions are produced. It follows that nasal diphtheria should never be accepted as a primary condition until all sources of irritation are excluded.

I am, Sir, yours faithfully,

May 8th, 1922. DUNCAN FORBES,
Medical Officer of Health, Brighton.

LETHAL X RAY DOSE FOR ANIMAL TUMOURS.

To the Editor of THE LANCET.

SIR,—In some letters from Dr. J. C. Mottram, Dr. J. H. D. Webster, and others, which have appeared recently in THE LANCET, my experiments on the lethal dose of X ray for animal tumours have been referred to. Dr. Mottram quotes from some general remarks which I made in a discussion, and, since the details of the work have not yet been published owing to the large amount of time required to obtain final figures, I believe that further information concerning the points brought up may be of interest to your readers.

Dr. Mottram is quite justified in making the statement that animal as well as human tumours cannot be summarily treated with a "carcinoma" or a "sarcoma" dose, as tumours of the same morphology show great variations in susceptibility to X rays and radium. Dr. Webster's criticism of my experiments on the ground that I ignored scattered radiation is not wholly justified. On the contrary, I paid a great deal of attention to scattered radiation and its effect on the lethal dose for animal tumours, as is shown by the following results. When the tumour was exposed suspended in mid-air on thin gauze or dental rubber at a considerable distance from any solid material so as to eliminate all scattered radiation, there was obtained what may be called a pure lethal dose; this was 75 minutes in a given set of experiments. When the tumour was placed on the surface of water, 30 cm. deep, the conditions being otherwise exactly the same, the time required was 60 minutes; in other words, scattering increased the lethal effect approximately 20 per cent. When the tumour was placed in a shallow glass chamber on top of a wooden table, the dose required was the same. When it was placed on a disc of paraffin, 8 cm. thick, the time required was about 50 minutes, or slightly less than when the tumour was placed on top of water. When the tumour was placed between two blocks of paraffin of given thickness or immersed in a tank of water at a given depth, the dose of X ray required to kill could be computed quite accurately from the non-scatter dose by the use of Dessauer's depth dose curves.

The erythema dose in the experiments just mentioned is approximately 15 minutes, computed from an average of various erythemas produced on patients. This erythema is very light, just a slight reddening of the skin of the thorax after a week or ten days. The difficult part of the problem is to convert the lethal tumour dosage into erythema dosage, since there is no agreement as to exactly what an erythema dose is. The killing points of the animal tumours so far tested are much more constant than is a skin erythema in a human being.

The dose required to kill all the cells of mouse tumour 180 without any scattered rays is five skin erythemas. A comparison between the times required

in two slightly different experiments illustrates very well the marked effect of scattering. When the tumour was placed under 10 cm. of paraffin with a lead screen in which there was an opening 10 cm. square on top of the wax, nine hours' exposure was required to kill all the cells, or 15 erythema doses on the skin. When a second block of paraffin was put under the tumour, the other being left above, the exposure required fell to about five hours, or some nine erythema doses on the skin. In applying these findings to the treatment of human tumours it must be remembered that the animal tumour on which these doses were measured is highly malignant and rapidly growing. In its biology it corresponds to the most active type of human sarcoma, a type which no one working with either radium or X ray has, so far as I am aware, made any claim to cure.

In determining the lethal dose of animal tumours we must kill all the cells, because we know that if one or two of the cells are left they are capable of growing. No one has ever proved that all the cells of a human tumour can be killed by a beam of X ray. I have seen, and others also, the total destruction, as far as could be determined by the study of serial sections, of all the cancer cells within a radius of 2 cm. in a carcinoma of the cervix after the application of large quantities of radium; but here the destructive action close to the tube is so intense that 20 or 30 erythema doses must have been applied. Unfortunately, in some of these instances the patients died shortly afterwards from recurrences from cells just out of range of the rays. Until the dose which is necessary to kill all the cells of a human tumour can be computed, those who believe that these animal tumours are more resistant than human tumours have no case in court. There is no doubt that extraordinary clinical benefit can be obtained from doses far lower than those here considered. Every experienced operator has seen a carcinoma regress for a time after the application of an erythema dose, but has also seen the same tumour return several years after regression, showing that not all the cells were dead. There is another important lesson to be learned from these animal tumour experiments, and that is that it is necessary to be exceedingly cautious in assuming that because a tumour disappears for a time it is necessarily cured. As the lethal dose of these animal tumours is approached their reappearance on inoculation is greatly delayed. A tumour normally growing to a considerable size in a week may not appear for two or three months, a period of time equivalent to four or five years in a human being. A considerable time must, therefore, elapse before the permanent cure of a human tumour by high voltage radiation can be assumed.

I am, Sir, yours faithfully,

FRANCIS CARTER WOOD,
Director, Institute of Cancer Research,
Columbia University, New York.
April 27th, 1922.

THE ERECT POSTURE.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Harry Campbell's letter in your issue of Feb. 11th I acknowledge that my theory regarding the liability of the pulmonary apices to be compressed by the ribs requires a considerable amount of further testing, but I hold there is post-mortem evidence of a definite tendency on the part of the lung apices to collapse or semi-collapse, these portions of most lungs being slightly firmer and less aerated than the lower parts. This can be corroborated in the living subject: (1) by the higher pitched and more solid percussion note at the apices than lower down, even when light percussion only is used, so as to avoid any effects due to the different thicknesses of lung involved; (2) by the louder vesicular breath sounds lower down than at the apices, and the corresponding diminution of vocal fremitus and resonance; (3) by inspecting the breath movements, which are certainly more marked and extensive the lower down in the chest one observes, except perhaps in women who

support the thoracic cage upon corsets and thereby limit the action of the diaphragm and so stimulate the respiratory centre to increased action of the intercostals, &c. The post-mortem rib markings are more pronounced of the first two ribs than of the lower ones. The fact that the cervical opening of the thorax is oblique in man, instead of transverse as it is in quadrupeds and monkeys, lends support to my contention.

It is quite true that, as Dr. Campbell says, "the inspiratory muscles attached to the upper part of the chest are at great pains to keep the lungs expanded," and this is demonstrated by the manner in which the anterior muscles of the neck (sterno cleido mastoids, scaleni, &c.) stand out especially in strong men as contrasted with women in whom the weight of the thoracic cage is relieved by corsets; but gravity may in some cases be more than a match for these muscles, gravity not only in the weight of the thoracic cage itself, accentuated by the drag of the abdominal muscles in their efforts to retain the abdominal contents, but also in the weight of the whole pectoral girdle with its attached upper limbs. There can be no reasonable doubt whatever that this effect is one of the most important contributory causes of phthisis, for not only is the aeration of the upper part of the lung seriously interfered with, but, what is far more important, the vascular supply is reduced to a fraction of the normal by the more or less continuous collapse, and in some cases even compression, of this part of the organ, instead of the normal rhythmical contraction and dilatation. Thus, it is highly desirable in those people who may have a tendency to apical phthisis that the muscles of the neck and shoulders should be well developed to fit them for the increased work of the erect posture, and one of the most suitable exercises for this purpose is that of hanging by the upper limbs in the manner of our ape ancestors, for not only does it produce the necessary development, but, by taking the weight of the pectoral girdle and its attached limbs from the upper ribs and substituting therefor the upward and outward pull of the muscles attaching the upper limbs to the thorax, it causes the desired expansion. The great value of recumbency for this affection is also indicated.

With regard to the second point which Dr. Campbell raised, the question as to whether the cerebral arterioles are or are not supplied with effective vaso-contractors and vasodilators as in other parts of the body, I understand they are not, for that is the teaching not only of Dr. Leonard Hill but also of most other physiologists, both present and past.

I am, Sir, yours faithfully,

Liverpool, May 3rd, 1922.

J. KNOX THOMPSON.

ARSENICAL POISONING.

To the Editor of THE LANCET.

SIR,—The letter of Dr. Chalmers Watson in THE LANCET of April 22nd is interesting and important as a reminder of the slow excretion of arsenic after its medicinal administration. In view of several cases within the last few years of criminal arsenical poisoning, I believe the attitude of the medical profession may undergo a change in view of some new facts. During the last 15 years the salvarsan compounds have been extensively used as the overture to the treatment of syphilis; their value depends, of course, on their arsenic which is combined with benzene. In the early years a large number of deaths followed the intravenous injection of those compounds. These deaths were due to acute arsenical poisoning. Modifications of the arsenobenzene combination have been tried and the mortality in recent years from salvarsan treatment has been considerably reduced, though it is not yet abolished.

In THE LANCET of Dec. 17th, 1921, p. 1273, there is a valuable and striking article by Dr. D. R. C. Shepherd and Major Elliot on a case of delayed neo-salvarsan poisoning. In this case salvarsan in known dosage was followed by death