

resistance by some other factor. Secondly, I would point out that the author's statement that there is no positive evidence that *Brucella* infection can cause abortion in women, though true at the time when I wrote my report for the Ministry, is no longer justified. Apart from the reports of a considerable number of cases in which there was presumptive evidence, more or less strong, of abortion, miscarriage, or premature birth being caused by *Brucella abortus* infection, at least one case has been reported in which full proof of abortion from this cause has been adduced. I refer to the case reported by Carpenter and Boak (*Journ. Amer. Med. Assoc.*, 1931, xcvi, 1212), in which *Brucella abortus* was isolated from the vaginal contents in a case of incomplete abortion. The nature of the organism was fully confirmed microscopically, by guinea-pig inoculations, and by agglutination and complement-fixation tests.—I am, etc.,

Ministry of Health, S.W., W. DALRYMPLE-CHAMPNEYS.
May 24th.

Iodine, the Thyroid, and Lymphatic Leukaemia

SIR,—Dr. M. C. G. Israëls (in the *Journal* of May 18th, p. 1021) does me the honour of quoting my reference to the treatment of lymphatic leukaemia with iodine, and I was naturally interested in his careful experiments to determine the value of this treatment. It is hardly possible personally to verify all the statements one makes in a textbook, and my recommendation of iodine in lymphatic leukaemia was based upon Friedgood's work.¹ I have now had the opportunity of employing iodine in several cases, and have never been persuaded that it has any useful effect.

A man of 56, with chronic lymphatic leukaemia of nine years' duration (proved by biopsy), had a total white cell count of 6,700 per c.mm. (lymphocytes 5,160) and a basal metabolic rate of +38 per cent. After ten days' treatment with Lugol's iodine solution, 10 minims three times a day, there was no change in the physical condition; the white cell count was 10,800 per c.mm. (lymphocytes 9,000) and the basal metabolic rate +46 per cent.

Some time ago I had under my care a young lady with chronic lymphatic leukaemia, whose symptoms closely resembled those present in the patient treated by thyroidectomy by Dameshek, Berlin, and Blumgart.² As she derived no benefit from orthodox measures, I persuaded her to have a complete thyroidectomy. The operation had absolutely no effect on her disease, and I therefore feel that the improvement which Dameshek reported was due not to the operation, but was a spontaneous remission such as many of us have seen in atypical cases of leukaemia.

The patient, who was 26 years old, had been under observation for two years with a relatively aleukaemic type of lymphatic leukaemia, of which the most troublesome symptom was a pruriginous eruption of the skin. The lymph glands throughout the body were moderately enlarged and the liver and spleen were easily palpable. A gland removed at biopsy showed the appearance of lymphatic leukaemia. In spite of various treatments, including α -ray therapy and iodine, her condition was getting steadily worse. Her blood count was: red cells, 3,000,000 per c.mm.; haemoglobin, 42 per cent.; white cells, 20,000 per c.mm.—neutrophils, 37 per cent.; eosinophils, 3 per cent.; basophils, 1 per cent.; lymphocytes, 48 per cent.; monocytes, 11 per cent. The thyroid gland was moderately enlarged and the basal metabolic rate was +28 per cent. After two transfusions Mr. E. G. Slesinger performed a complete thyroidectomy on June 19th, 1934; sections of the gland showed a colloid hyperplasia. Further transfusions were necessary after the operation, and there was no change in the clinical condition. Six weeks after the operation the blood

count was: red cells, 3,100,000 per c.mm.; haemoglobin, 52 per cent.; white cells, 11,200 per c.mm.—neutrophils, 35 per cent.; eosinophils, 5 per cent.; basophils, 1 per cent.; lymphocytes, 42 per cent.; monocytes, 16 per cent.; myelocytes, 1 per cent. The lymph glands, the spleen, and the liver had not altered in size. The basal metabolic rate was still +12 per cent., though her appearance was now definitely myxoedematous. Treatment was subsequently continued with small doses of thyroid and α -ray therapy. Five months after the operation her condition had deteriorated, the glands had increased in size, the white count was 6,700 per c.mm., and the haemoglobin 24 per cent. I have just heard from Dr. W. M. Ramsden, who was in charge of the case, that she died on May 12th, 1935.

It would appear from Dr. Israëls's work, to which these casual observations of mine are added, that the resemblance of lymphatic leukaemia and hyperthyroidism is superficial and not due to an aetiological relation; that iodine is of little or no therapeutic value; and that the operation of thyroidectomy is unjustifiable in the treatment of lymphatic leukaemia.—I am, etc.,

St. Bartholomew's Hospital,
May 23rd.

L. J. WITTS.

Selenium in the Treatment of Cancer

SIR,—I was naturally extremely interested in the letter from Dr. Hernaman-Johnson bearing this title in your issue of May 18th, for it is now sixteen years since I introduced this method in Bristol (at the Royal Infirmary), and you published my first note on the subject in October, 1919. A year later (*British Journal of Surgery*, 1920, viii, No. 29, p. 50) I published an abstract of an M.D. thesis devoted to the subject, in which I pointed out the possible applications of selenium in pre-operative and post-operative treatment, and mentioned the combination of radiotherapy with injections of selenium. The results impressed me so favourably that since then I have at no time been without a number of patients under this treatment, employing the intravenous "collosol" selenium that Messrs. Crookes kindly prepared for me. I have frequently shown patients at medical meetings, and published notes of cases treated both with selenium injections alone and in conjunction with radiation treatment: it is possibly my own fault that this work has not enjoyed the *réclame* of some other labours in the same field.

Dr. Hernaman-Johnson has referred, both in his letter and elsewhere (*Proc. Roy. Soc. Med.*, Clinical Section, xxviii, No. 6, April, 1935, p. 758) to the method of treatment by injections of selenium combined with α rays as "Dr. A. T. Todd's method," which might give rise to some confusion unless this is more exactly specified. Dr. Todd's earlier publications on the subject of chemotherapeutic treatment (*Bristol Medico-Chirurgical Journal*, 1927, xlv, No. 164, p. 144; *Chemotherapeutic Researches on Cancer*, J. W. Arrowsmith Ltd., 1928) dealt with injections of lead selenide, in which the selenium was regarded as merely an adjunct: throughout, the dosage is given in grams of lead. At that time Dr. Todd considered selenium (without lead) as quite inert against cancer, and that it was definitely dangerous to combine α -ray with chemotherapeutic treatment. The clinical experience of years led me to disregard these views, and to continue the methods which I had found, if not completely satisfactory, at least of material benefit. But it is comparatively recently that Dr. Todd has become a convert to the efficacy of selenium without lead and its safety with α rays.

With Dr. Hernaman-Johnson's protest on the harmlessness of selenium injections, with or without α rays, I am in hearty agreement. Since no special provision of beds has been made for my work and treatment may be continued for many months, nearly all my patients have been

¹ Friedgood, H. B.: *Amer. Journ. Med. Sci.*, 1932, clxxxiii, 515.

² Dameshek, W., Berlin, D. D., and Blumgart, H.: *New England Journ. Med.*, 1934, ccx, 723.

treated as out-patients: The scheme at which I aim is to give about fifty intravenous injections of 10 (sometimes 15) c.cm. of "colloidal" selenium during the first year, generally about two a week, with rest intervals of three weeks after each six weeks' treatment; but the exact spacing of doses is partly determined by whether x-ray, radium, or surgical treatment is considered advisable in addition. There has never been any evidence of selenium poisoning at all, except that within a few minutes after injection, with the earliest injections, a transient disturbance is sometimes noted. There appears to be no object in increasing the dose above this: the best results are obtained with a long course of small doses rather than by large doses concentrated in a short time. The only effective means of convincing any individual that the method is of value is to persuade him to try it over a series of cases. It is safe, not expensive, and can be carried out while the patient remains at work; and I hope the publicity of these letters will lead to more surgeons giving it a fair trial.—I am, etc.,

Clifton, Bristol, May 23rd.

E. WATSON-WILLIAMS.

SIR,—Though greatly tempted, I am informed that to ignore Dr. Douglas Webster's agglomeration of mis-statements in your issue of May 25th (p. 1097) would probably give a wrong impression. I will deal only with his assertion that selenium is a toxic substance.

Dr. Webster appears to think that selenium is one substance, that all selenium products are similar, and that the evidence as to one product is applicable to all. Selenium is a very complex element, with at least five isotopes; it can enter into the composition of as many compounds as can sulphur. As with sulphur and other reactive elements, it can produce compounds which run all the gamut of complete inactivity to intense toxicity. His evidence, quoted from the findings of Petersen, Gillett, and Wakely, Datnow, and von Wassermann, is therefore of no value in this connexion, as the preparations which they used were very different from that which he attacks. The colloid SSe is relatively non-toxic, provided certain elementary rules of cleanliness of the glassware used in its administration are carried out. The toxic dose for mice is 1.5 c.cm. per kilo; the optimal therapeutic dose for mice with slow-growing implant cancer is 0.12 c.cm. per kilo; the therapeutic index is therefore good. The toxic dose for man has not been estimated, but doses up to 25 c.cm. have frequently been given when necessary to obtain the slight late focal reaction which has been found to be optimal.

Dr. Webster considers selenium treatment as similar to, if not identical with, protein shock. This is incorrect; protein shock, as from milk, etc., gives a shock which comes on rapidly and is associated with pyrexia. SSe, administered properly, never produces any shock; but four to forty-eight hours later, dependent upon the dose, there appears a mild focal reaction, as occurs after an optimal dose of a vaccine; there is no pyrexia, but an antipyretic action, if pyrexia be a symptom of the neoplasm. Any shock-like sequel occurring within two hours of injection is due to faulty technique; and it should be carefully avoided, as such shocks damage the patient. Shock reactions are now infrequent in my clinic—not more than about twelve a year, divided among fifty or more patients.

RAS, and to a less extent SSe, are relatively stable colloids, but they will not stand up to unclean syringes. It is not generally understood that glassware is exceedingly difficult to clean; many substances are adsorbed to its surface, and may not be removable. It is this adsorption of crude spirit, alkaloid, or serum which causes shock reactions; the colloid itself, so far, has never been

to blame. Several batches of colloid, returned to the manufacturers from London and provincial centres, have been sent to my clinic; in no case has any toxicity been found, and the whole of the batches have been used in routine treatment of my cancer patients. The patients of my clinic attend weekly from distances which vary up to eighty miles; they travel by train or by car. They come, have their injections, and go home at once. Is it likely that this would continue if shock reactions were the result?

A leaflet giving some hints on the administration of these colloids is being prepared, and will be obtainable from the manufacturers. If Dr. Webster will follow these instructions implicitly he will find that the colloids RAS and SSe are no longer toxic. The method is far from fool-proof: attention to certain elementary rules is an absolute necessity if beneficial results are to follow.—I am, etc.,

Clifton, Bristol, May 26th.

A. T. TODD.

Poliomyelitis in Boarding Schools

SIR,—I have to thank Dr. R. W. Fairbrother for his reply (p. 1052) to my letter (p. 999) questioning his opinion that the closure of boarding schools infected with poliomyelitis is a dangerous step, and asking for the facts on which his view is based. He replies that "definite evidence supporting either view does not appear to be available"; but this is a hard saying, since lack of evidence that the procedure is harmful is the only proof that we can expect of its being harmless. Moreover, it is difficult to believe that the facts are not available somewhere. A few years ago several schools were closed down owing to poliomyelitis, and the disease is notifiable. I am, as I stated before, under the impression that no harm came of it; and at least until the evidence is available the dictum of the Ministry of Health (1932) that the "balance of advantage" is against the closure of the infected school is not likely to weigh with parents in the horrid position of having a child in danger.—I am, etc.,

London, W.1, May 27th.

REGINALD MILLER.

Compensation for Weil's Disease

SIR,—In the *Journal* of May 25th there is an article on compensation for Weil's disease, which states that "the latest disease to be added to the category of 'accidents' is Weil's disease." I wish to record that the widow of a patient of mine (who died of this disease in 1925) was awarded compensation in February, 1926. The patient was a coal miner who was infected during his work in a pit where rats were present. The disease was quite definite clinically, and the diagnosis was confirmed by post-mortem examination.

I understand that several rats from the pit were examined, but the reports of that examination were not produced in court, and the assumption that the infective organism was found was apparently confirmed by the sheriff's decision in favour of the plaintiff.—I am, etc.,

Lochgelly, Fife, May 27th.

D. ELLIOT DICKSON.

Tuberculosis in Home-contacts

SIR,—The letters on this subject by Drs. Jessel and S. G. Tippet, in the *Journal* of April 20th and May 11th, are so interesting that it seemed worth while to check them from the light of available insurance statistics. In the matter of statistics it is advantageous to obtain actuarial assistance. Accordingly I asked for the help of Mr. A. B.