TABLE II.—*Series of Scarlet Fever Cases Treated with Thyroid and Iodine and Controls*

		Albuminuria	Nephritis
Test cases	 165	34 (21%)	11 (6.6%)
Controls	 162	26 (16%)	9 (5.5%)

It was evident that our method was having no beneficial effect in this type of scarlet fever. We therefore submitted another series of alternate cases and controls to Osman's method, giving the alkaline mixture to the test cases in the doses he recommended continuously throughout the period of their stay in hospital, while the controls received alkalis for the first two days of their stay in hospital only. The results are shown in Table III.

TABLE III.—*Series of Scarlet Fever Cases Treated with Alkalis (Osman's Method) and Controls*

		Albuminuria	Nephritis
Test cases	 124	15 (12.1%)	5 (4.3%)
Controls	 134	25 (18.6%)	6 (4.1%)

In this series it was also evident that no statistically significant improvement was being effected by Osman's method. On referring to Table I it will be seen that the incidence of nephritis was higher during 1935-6 than during any other period in the last twenty-seven years in Bristol.

Conclusion

It would appear that the various strains of streptococci causing the symptoms of scarlet fever vary greatly in their power of producing renal complications, and that methods which seem to be effective in a controlled series of cases in preventing the complication of nephritis caused by certain strains may fail completely against other strains. A reliable means of preventing this serious complication which is effective against all strains of streptococci is still to be found.

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R. B. Engelstad (*J. Radiol. Electrol.*, February, 1937, p. 53) reports the results of radium therapy in fifty-six cases of cancer of the buccal cavity. These included cancer of tongue, of the mouth proper, and cancer of the gums. The treatment consisted of teleradium therapy alone, or teleradium therapy plus radium implantation plus electrocoagulation, or of teleradium therapy plus surgical operation. The cervical metastases were treated either by teleradium therapy or by teleradium therapy plus operation. The source of radiation for the teleradium therapy consisted of a radium unit containing 2,600 mg. of radium element. The distance between the source of radium and the skin varied between 5.7 and 12.5 cm. Several fields were irradiated depending on the size and situation of the tumour. One field was treated each time and the dose varied between 3 and 6 Dominici units ($1\frac{1}{2}$ to 2 hours), and a total of 50 Dominici units was applied. Skin and other reactions all cleared up in two to three weeks. The results of the treatment of the fifty-six cases were as follows: $1\frac{1}{2}$ to 4 years' cure, twenty-nine patients (53 per cent.); cure after recurrence, three patients; cured for the time being, thirty-two cases; alive but not cured, four cases; dead, twenty cases (36 per cent.).

CARCINOMA OF BREAST WITH WIDE-SPREAD METASTASES TWO CASES OF RECOVERY

BY

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I venture to report these two cases in view of the extremely satisfactory results which followed treatment. Both were cases of mammary carcinoma in which wide-spread metastases had occurred, and both patients are now, between one and two years after cessation of treatment, in good health and free from any sign of carcinoma. One of them had had no operation, as she did not present herself to a doctor until the disease was too far advanced for surgery; the other had had a radical amputation of the breast eighteen months before the presence of secondaries was discovered and treatment begun.

Case I

An unmarried lady of middle age was sent to me in August, 1934. There was in her right breast, adherent to the skin, a carcinomatous lump, which was broken and discharging slightly. There were secondary glands in the axilla and above the clavicle, and also secondary deposits in several bones of the thorax and shoulder-girdle. Her general condition was very poor. I thought she was not fit for intensive x-ray therapy, and suggested that she should submit to a course of treatment by Todd's method. She agreed to this, and after some delay treatment was begun early in November. At that time she was entirely confined to bed, and had to be brought by ambulance and stretcher for all x-ray treatment. She was wasted and had much pain, for which morphine had been necessary. She took food badly and was often sick.

On beginning treatment all morphine was stopped. She was given a weekly intravenous injection of compound colloid of selenium and sulphur, followed two days later by a mild dose of high-voltage x rays; a dressing of Paré's ointment (lead amalgam) was applied to the breast. It was found impossible to give her the calcium mixture recommended by Todd; she could not tolerate it, and she only took radiostoleum and thyroid extract intermittently. Her veins were very small and there was considerable difficulty with the injections, which led to some delays and irregularity in the course of the treatment. Eventually the injections had to be stopped altogether—sooner than would have been the case under more favourable circumstances. The breast began slowly to improve not very long after starting treatment, but otherwise there was no change, except some relief from pain.

In the early part of 1935 there was complaint of fresh pain in the lower part of the back and pelvic region, and radiographs revealed extensive secondary deposits in the spine and pelvic bones. The outlook appeared very gloomy, but nevertheless treatment was continued. The one bright spot was the condition of the breast, which by this time had vastly improved. I must pay tribute to the patient's perseverance and great tenacity of purpose. General improvement became evident at last in April, 1935. Pain was much less and the sickness stopped; the appetite improved, and before long the patient was eating more than she had done for years. In the middle of May she could sit up out of bed, and on June 1 was just able to take a walk in the garden. No treatment was given between the end of July and the middle of October.

Her general condition was then quite good and she had put on a lot of weight; the breast was quite healed, and little or nothing could be felt of any glands. Pain was practically non-existent, and she was getting about freely. Radiographs, however, still showed extensive patches of rarefaction in the bones affected, though there was some indication of fresh mineralization. I did not think it wise to attempt a further course of intravenous injections on account of the great difficulty experienced before, but I gave another course of high-voltage *x* rays in moderate doses, covering the whole trunk and extending over a period of two months. At the same time she was able to take continuously a calcium mixture, radiostoleum, and small doses of thyroid extract.

There has been no treatment since December, 1935. The breast was then quite normal, apart from pigmentation of the skin near the nipple; glands were scarcely recognizable, and the patient's general health was good. She had put on 3 st. in weight, and there was no evidence of any active disease, though mineralization of the old centres of disease in the bones was not yet complete. In spite of a severe attack of shingles, with varicella, in the spring of 1936, which kept her in bed for many weeks, there has been no recurrence of the carcinoma. I have seen her recently and found her in good health, though complaining of being too fat! There is no sign of any disease, and the bones have almost entirely recovered their density.

Details of Treatment

It may be well to give a summary of the treatment employed, with details of dosage and times of administration.

Between November 4, 1934, and April 2, 1935, intravenous injections of colloidal selenium and sulphur were given ("SSe," prepared by British Drug Houses). The initial dose was 2 c.cm., and throughout the course no single dose was more than 4 c.cm. The injections were given every week, except for an interval of three weeks between November 25 and December 17, one of a fortnight between January 29 and February 12, and one of three weeks between March 12 and April 2.

Two days after each injection *x*-ray treatment was given. Usually two areas were irradiated at each sitting, but sometimes only one. The dosage employed was somewhat variable, but was always between 75 and 100 *r* to each area. The focal skin distance was 50 cm., the kilovoltage 180, and the rays were filtered through 0.5 mm. of zinc and 1 mm. of aluminium. During April and the latter part of March, when only one injection was possible, weekly dosage with *x* rays was continued and the dose increased to 120 *r*.

There was no treatment between April 17 and June 27. Then followed four more weekly injections of "SSe" (4 c.cm.), with a dose of *x* rays (100 *r*) two days after each injection. No more selenium was given at any time after July 23, 1935, and no other treatment at all until October 16.

Between October 16 and December 18, 1935, sixteen applications of *x* rays were given. The whole trunk was irradiated, being divided for this purpose into six areas, and one area was treated at each sitting. The dose employed was 200 *r* at 200 kV. The focal skin distance was 50 cm. and the rays were filtered through 0.5 mm. of zinc and 1 mm. of aluminium. Throughout this last course of *x* rays, and for a fortnight afterwards, the following medicines were taken:

Dry thyroid extract 1/10 grain once daily.

Radiostoleum, 6 drops twice daily.

Mixture, twice daily:

Calcium chloride	...	...	...	gr. 15
Sodium iodide	...	...	...	gr. 5
Sol. pectin	...	...	...	3 2
Syr. simplex	...	...	...	3 1/2
Aq. dest.	...	...	...	ad 3 1

Case II

In September, 1932, a lady of middle age, with two children, had her right breast amputated for scirrhus carcinoma. In September, 1933, she had a hysterectomy for fibroids, and later I *x*-rayed her on account of severe pain and weakness in the left leg, but found no cause in the spine or pelvis. A further *x*-ray examination of the bones was made in London in January, 1934, and this was also negative. In April, 1934, there was a sudden onset of pain in the lower thoracic region, of girdle type. There was still much pain in the region of the left hip, and pain also in the neck and right shoulder and in the region of the left ischial ramus. Again an *x*-ray examination was carried out, and I found secondary carcinomatous deposits in both ilia, in the left ischial ramus, in the fifth and sixth cervical and the fourth and fifth lumbar vertebrae, and, lastly, a doubtful spot in the ninth dorsal vertebra. All movements were painful, and the patient had to be brought for examination by ambulance and stretcher.

It was decided to give high-voltage *x*-ray treatment for the relief of pain and in the hope of promoting local healing. This was carried out in May, and all the bone lesions were treated with the exception of one small spot in the right ilium. Massive doses were given, but no lesion was irradiated through more than two fields.

In June there was considerable improvement; pain was much less and her general condition better. She was able to walk a very little. In August she was a great deal better, had no pain, and was walking well. In September an *x*-ray examination showed all the bone lesions healed and well mineralized, with the exception of the small one in the right ilium which had not been irradiated.

In order to carry on the good work and if possible to complete the "cure," it was agreed that it would be well to give a course of treatment by Todd's method. The patient and her husband were willing, and treatment was accordingly begun early in September, 1934. Weekly intravenous injections of the compound colloid of selenium and sulphur were given, followed two days later by mild applications of high-voltage *x* rays. This was continued for six weeks, and then the *x* rays were stopped and a radio-active colloid was alternated with the selenium and sulphur colloid, week by week, until December 11. The veins were difficult to inject, and sometimes there was trouble with rigors and vomiting after the injections.

The patient went away in December for a month's holiday at Newquay, and on her return the alternate weekly injections were started again. Seven were given up to March 19, 1935, but she has had none since. There was continuous increase in weight from September—in one week as much as 5 lb. was gained—and on February 19, 1935, her weight was 11 st. 3 1/2 lb., which represented a gain of about 3 st. During the treatment the patient did not have the medicines recommended by Todd. *X*-ray examination after the course showed all the old lesions still healed, and *also* the one in the right ilium.

In March, 1936, a year after cessation of treatment, a small rarefied spot was discovered in the seventh rib on the left side. This quickly cleared up after two applications of high-voltage *x* rays (200 kV), with a total dose of 800 *r*. Since then no evidence of carcinoma has been discovered. The patient has led a normal life.

Details of Treatment

Between May 4 and May 25, 1934, six applications of *x* rays were given. All diseased areas of bone received treatment except the small one in the right ilium. On each occasion a full erythema dose was given, but no lesion was irradiated through more than two fields. The focal skin distance was 40 cm. and a current of 3 mA at 200 kV was employed.

Between September 4 and October 11, 1934, the patient had six weekly intravenous injections of colloidal selenium and sulphur. The initial dose was 2 c.cm.; all the others were 4 c.cm. X-ray treatment was given two days after each injection. One or two areas were irradiated each time, and received 100 *r* at 200 kV from a distance of 50 cm. All diseased areas of bone were treated. On October 16 4 c.cm. of "SSe" were injected, but no *x* rays were given afterwards.

From October 23 to December 11 alternate weekly injections of RAS (radio-active selenide) and "SSe" were given. The initial dose of RAS was 1½ c.cm., but later doses were graduated up to 5 c.cm. The dose of "SSe" remained at 4 c.cm. There was similar alternation of "SSe" and RAS between January 23 and March 19, the doses being 4 c.cm. and 5 c.cm. respectively.

After this no further treatment was given except the two doses of *x* rays on March 31 and April 1, 1936, already mentioned. Each dose was 400 *r* at 200 kV, and the focal skin distance was 45 cm. Medicines were not administered.

Commentary

In the application of radiation for the treatment of cancer it is generally accepted that there must be two main objectives: (1) the administration, at suitable intervals of time, of sufficient *x* rays to all parts of the growth to produce a lethal effect on the cancer cells; and (2) the control of irradiation of the surrounding tissues so that their vitality shall not be destroyed or unduly depressed. It would seem, from a consideration of the two cases quoted and of others on record, that there are other factors in the re-establishment of normal conditions which do not depend entirely on a primary lethal effect on the cancer cells, and that there is room in our practice for a method of attack in which the prime object of irradiation is not the *direct* destruction of the vitality of these cells.

In neither of these cases was the radiation given in sufficient quantity to ensure such an effect, and in Case I, at any rate, the extent and distribution of the lesions and the condition of the patient prohibited heavy dosage. In Case II, although massive dosage was first employed and had a very beneficial effect on the lesions treated, it was given primarily for the relief of pain and hardly in sufficient quantity to ensure a lethal effect on the deep-seated lesions. Moreover, one small metastasis in the right ilium was not treated at all the first time, and was still present four months later when treatment with selenium and small doses of *x* rays was begun; it quickly cleared up under this. Case I was in an extremely advanced stage when treatment was begun: the patient had in fact been told before I saw her that she had probably only three or four months to live. In any event her condition was such that I should have refused to attempt any treatment by heavy *x*-ray therapy.

Todd, looking upon cancer as an infective disease, bases his method on the natural, though insufficient, resistance of the patient, and holds that his treatment acts by stimulating the patient's defensive mechanism and improving his general condition. Whether or not this is a full, or even a true, conception of what occurs, the fact remains that there have been some remarkable

successes with most unpromising material. The avoidance of very heavy dosage by *x* rays or radium, with its attendant dangers and often depressing effects, is surely one great advantage of this method of treatment. Another is that it can be employed, with the possibility of some success, even in very advanced cases which ordinarily would get nothing beyond palliative and pain-relieving treatment. One obvious disadvantage is the necessity for repeated and frequent intravenous injections. These have to be well controlled and given with great care, and difficulties are apt to arise in connexion with the veins, especially when they are small. Everything considered, it would seem that the method can be looked upon as a useful addition to the means of dealing with cancer.

Clinical Memoranda

Recovery from Streptococcal Meningitis After Prontosil

After reading Dr. Christia F. Lucas's account (*Journal*, March 13, p. 557) of a case of streptococcal meningitis successfully treated with prontosil, I feel that the following report of a somewhat similar case may be of interest.

CASE REPORT

A youth aged 17 was admitted to hospital on November 6, 1936, having fallen down a lift shaft from the fourth floor to the basement. He showed clear clinical signs of a fracture of the anterior fossa of the skull—profuse bleeding from the nose and subconjunctival ecchymosis of the right eye. There were no other injuries, the pulse rate was 84, and, although there was a history of a few minutes' unconsciousness, he was already conscious, though somewhat irritable, on admission.

The patient made good progress and was regarded as practically convalescent when, on the morning of November 13, his temperature rose to 102° F. and the pulse rate fell to 68. He was drowsy and complained of pain behind the eyes. There was slight head retraction and Kernig's sign was positive. On lumbar puncture turbid fluid which was under slight pressure was withdrawn; it contained hundreds of polymorphonuclear leucocytes but no organisms. Culture was sterile, and the chloride content 650 mg. per 100 c.cm. of fluid. The next day he was quite comatose and incontinent of urine and faeces. Lumbar puncture was repeated with identical findings.

By November 20 the pulse rate had fallen to 48, feeding was practically impossible, and the patient's general condition was pitiable. A third lumbar puncture was performed, and this time streptococci were found on direct examination. An intravenous injection of 20 c.cm. of prontosil soluble was given at once and repeated in eight hours. That evening his temperature was 98° F. and pulse rate 64, and he took fluids freely. Culture confirmed the presence of a haemolytic streptococcus, and treatment was continued with prontosil album by mouth and two tablets thrice daily. There was no further rise of temperature and he improved rapidly in every way. The prontosil was stopped on November 29, by which time the patient appeared perfectly recovered; there were no signs of toxic effects from the drug. He was discharged on December 4. When he reported three months later there was no evidence of mental deterioration and he was in excellent physical condition, the sole stigma of past illness being a slight ptosis of the right eyelid.

I am indebted to Mr. Howard Stevenson, F.R.C.S., senior surgeon to the hospital, for permission to publish this case.

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