The cases show that, as a rule, carcinoma of the breast readily responds to radium, both in the primary tumour and in secondary deposits. In inoperable cases brilliant local results may be expected, but as in these cases the ultimate outlook depends on the existence of secondary deposits, local disappearance must not be interpreted as cure. In operable cases we feel that the results so far obtained justify the use of radium by the method we have indicated. In these cases, however, it is of the utmost importance that they should be kept under the closest observation, so that any recurrence may receive immediate attention. The treatment of carcinoma of the breast by radium must at present be regarded as in the experimental stage, although personally we regard the experiment as a very hopeful one.

The Oesophagus.—Carcinoma of the oesophagus is at the present time, and perhaps essentially, an incurable condition, and one can only aim at enabling the patient to swallow. The 26 cases here reported show beyond question that in a large proportion of cases this can be achieved by means of radium, giving relief for periods up to fourteen months. In 15 of these cases the relief was such that the patient could swallow soft solids with ease, and in 4 he returned to an almost normal condition; in 5 other cases there was definite improvement. There is thus no doubt that carcinoma of the oesophagus responds readily to radium introduced by this technique. We may have been unduly cautious in dosage, but those who are familiar with the direct examination of these cases will realize the risks involved. We can happily claim that no untoward event has followed on the operation in any instance, so that in skilled hands the method would appear to be reasonably safe.

Various Sites.—These were all experiments in otherwise hopeless cases. In 3, however, there was very striking improvement and relief over a long period. In many ways Cases 81 and 82 showed the most remarkable results in the whole series, although followed later by secondary deposits. In the case of carcinoma of the rectum the tumour has entirely disappeared, and the patient is in perfect health after sixteen months.

THROMBO-ANGIITIS OBLITERANS IN NON-HEBREW SUBJECTS, AND REPORT OF A CASE OF CHRONIC ULCUS CRURIS IN A YOUNG MAN.

BY

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A CONSIDERABLE proportion of cases of thrombo-angiitis obliterans have been reported during recent years as occurring in Great Britain and Ireland, in English, or at least non-Hebrew, families.* The following men were recently almost simultaneously in-patients at the German Hospital, and their symptoms present certain special points of interest. The first two are certain cases, the third one is altogether doubtful.

CASE I.

An Englishman (no Hebrew ancestry), aged 22 years, was admitted on July 24th, 1929, on account of cyanotic discoloration of the region of the left great toe, and pain and symptoms typical of thrombo-angiitis obliterans dating from January, 1928. In other respects the patient appeared healthy, and his Wassermann reaction was negative. From the age of 16 he had been accustomed to smoke cigarettes up to twenty daily.

On September 7th, 1929, a modification of periarterial sympathectomy was performed on the left thigh by Mr. Wright during Mr. Rast's absence. The operation was followed by an immediate rise in the superficial temperature of the affected limb and by diminution of pain, but the improvement was not lasting, nor was the result of diathermy really satisfactory. Although slight "mummification" developed at the tip of the left great toe, the condition is now rather better than worse, and amputation has not yet been resorted to. The clinical picture is the typical one seen by us in Hebrew cases, but the patient's age is younger

than that of most Hebrew sufferers. Though the local condition in this case is very bad, it was almost as bad for a long while in one of the earliest of Dr. Weber's Jewish cases of the kind—a man who is still living and has all his limbs.*

CASE II.

An English assistant in a drug factory, without any Hebrew or foreign ancestry, and aged 38, was admitted on June 1st, 1929, with a large chronic deep ulcer, like a tabetic "perforating" or pressure ulcer, about the size of a penny, at the back of the right heel. This had started as a mere crack in the thick skin in February, 1928, and had gradually enlarged since then; so far as the patient himself knew there had been no traumatic or other cause for its commencement. He compared the pain in his right heel and right calf with that of a toothache. For about six months before the appearance of the ulcer there had been pains in the calf of the right leg on walking; these were of the usual intermittent claudication type, as in typical Hebrew cases of thrombo-angiitis obliterans. The patient had been a great smoker in the army during the war. Before the commencement of the ulcer there had likewise been attacks of pallor and numbness in the toes of the right foot, but otherwise the patient had enjoyed good health.

No pulsation was felt in either arteria dorsalis pedis. Apart from the thrombo-angiitis obliterans we found no abnormal symptoms by examination of the thoracic and abdominal viscera, the nervous system, the eyes, and the blood and urine. The brachial blood pressure was 135/75 mm. Hg. The Wassermann reaction was negative. The knee-jerks were rather active. Warm weather somewhat lessened the pain. On July 9th, 1929, Dr. A. P. Cawadias examined the patient's limbs with Pachon's oscilometer, and found the oscilometric index as follows:

		Right side	Left side
Calf of leg	...	0	1½
Thigh	...	6	6
Upper arm	...	5½	5½

Both legs therefore showed arterial ischaemia.

After treatment by insulin and other methods—including periarterial sympathectomy on August 30th—had been tried in vain, Mr. Rast resorted to amputation of the right leg on September 14th; owing to gangrene in the stump a second amputation had to be performed on September 21st through the middle of the thigh. The patient left the hospital on October 18th in good condition, though he still had a little pain "in the amputated limb." Since then he is reported to have been doing well. On macroscopic and microscopic examination of the parts from both amputations the arteria tibialis anterior seemed normal, but the arteria tibialis postica appeared to be rather small, and was blocked by a canalized thrombus. The popliteal artery (removed at the second amputation) was blocked by more recent, partly organized, thrombus.

In this case the deep ulcer at the heel was an unusual early symptom in thrombo-angiitis obliterans. In the hospital at the same time with this patient was a somewhat older man, aged 50, complaining of a chronic callous ulcer under the left great toe, but his blood serum gave a strongly positive Wassermann reaction, and antisyphilitic treatment led to an excellent result. It is interesting that in the older man the pulsation in the arteria dorsalis pedis on both sides was excellent, and by Pachon's oscilometer Dr. A. P. Cawadias found the "oscilometric index" at the right calf to be 4, against 5 at the left calf, suggesting that the chronic ulcer in the left foot had increased the blood supply on the left side and had made the "oscilometric index" somewhat greater in the left than the right leg.

CASE III.

An Englishman, aged 25 years (without any Hebrew or foreign ancestry), was admitted on May 8th, 1928, on account of a large indolent chronic ulcer on the left leg, with much pigmentation in the neighbourhood; on the other leg he had similar pigmentation and scars of previous ulcers. He said he had never had any decided varicose veins, and the leg ulcers had first developed after pneumonia about the winter 1925-26. He was of slender build and rather pale, but otherwise apparently healthy. He mentioned that he had been accustomed to smoke about twelve cigarettes daily since the age of 16. There was nothing special in the family history, except that his father had suffered from chronic ulcers on both legs for thirty years before his death at the age of 66. Examination of the thoracic and abdominal viscera, nervous system, eyes, urine, and blood revealed nothing abnormal, and the Wassermann reaction was negative. A periarterial sympathectomy in the left thigh in February, 1927 (at another hospital), had done no good.

After prolonged rest in bed, and the failure of a variety of methods of treatment, Mr. Rast, at the patient's urgent request,

* See, for instance, Telford and Stopford, *British Medical Journal*, 1924, ii, p. 1035; Sir W. I. de Courcy Wheeler, *ibid.*, 1927, i, p. 225; Marnoch and MacRae, *Journ. Path. and Bact.*, 1927, vol. 30, p. 39; R. O. Girdwood, *ibid.*, 1927, vol. 30, p. 643; Girdwood, *ibid.*, 1928, vol. 31, p. 549.

* F. Parkes Weber, *Lancet*, 1908, i, p. 152; 1925, ii, p. 21.

amputated the left leg at the junction of the upper and middle thirds of the tibia on June 5th, 1929. Macroscopic and microscopic examination of the blood vessels at the site of amputation showed nothing special, and the wound healed up well at first. On July 11th, when he was getting about on crutches, slightly varicose veins were noticed in the right leg. In the right foot there was good pulsation in the dorsal artery and in the posterior tibial artery behind the internal malleolus. The brachial systolic blood pressure in both arms was 125 mm. Hg. The "oscillometric index" at the left thigh (above the site of amputation) was three divisions, and that at the right thigh, and also at the right calf, was five divisions.

However, on September 25th amputation through the middle of the left thigh had to be performed because of chronic gangrenous trouble in the stump. Macroscopic examination of the amputated part revealed some periarterial "matting" about the popliteal artery, and microscopic examination showed the artery to contain some not very old thrombus. The patient had apparently, for the last month or so, followed our advice in giving up tobacco smoking altogether. By October 19th the operation wound had almost completely healed, and there were no signs of ischaemic circulation in the stump, but a sequestrum formed, which had to be removed later on. There is still slight discharge from part of the operation wound (February, 1930), though the patient can get about well on crutches.

We confess that in the third case the diagnosis of the exact nature of the condition remains uncertain. The changes in the popliteal artery hardly afforded sufficient explanation, and an ulcer cruris must be very rare indeed as the sole or main symptom of thrombo-angiitis obliterans. The supposition that the large leg ulcer was of the ordinary kind, though without obvious varicose veins, in an individual with very poor local tissue resistance against trauma and pathogenic microbes of low-grade virulence, seemed hardly tenable for the present case. In this connexion we searched especially for any sign, however slight, of congenital haemolytic jaundice (anaemia), but with negative results.*

Remarks.

One of us (F. P. W.) has formerly seen various cases of intermittent claudication of lower extremities in English (non-Hebrew) subjects, some of them medical practitioners, but, so far as he could judge, they were mostly due to arterio-sclerosis (atheroma) of large arteries. He believes that such cases seldom progress to actual gangrene, or die of the disease in question, but in one case a post-mortem examination (after death from another disease) was made by the expressed wish of the patient, and old advanced atheroma of the abdominal aorta and iliac arteries was discovered.† Syphilitic arterial disease is certainly very rarely the cause of symptoms resembling thrombo-angiitis obliterans.‡

Recently, at other London hospitals, Dr. Weber has been given the opportunity of seeing examples of apparently true thrombo-angiitis obliterans in men without any Hebrew ancestry; in one man amputation was necessary, and in another gangrene occurred, followed by death.§ A probably arterio-sclerotic case was that of a doctor who, in 1912, when 49 or 50 years old, suffered from severe ischaemic symptoms in the left leg. Dr. Weber saw him first in 1913. He recovered sufficiently to do very active local work during the war, but developed angina pectoris in 1922. From 1924 he had symptoms of occlusion of various blood vessels. The attacks of angina pectoris continued, and he died with gangrene of the right leg in December, 1926, having refused amputation.

It seems as if intermittent claudication from arterio-sclerosis (atheroma) is almost as much confined to males as is thrombo-angiitis obliterans, and in both classes nicotine is usually a prominent item in the past history. In this connexion one must remember the extreme rarity of nicotine abuse among Jewish women of the poorer classes; but it has even been suggested that the female sex factor bestows constitutional immunity from thrombo-angiitis

obliterans. Cardiac symptoms (slight angina pectoris, etc.) are probably more likely to be associated with intermittent claudication of the lower extremities when the latter is due to arterio-sclerotic changes than when it is due to thrombo-angiitis obliterans. Indeed, in cases of intermittent claudication in lower extremities, due either to arterio-sclerotic changes or to thrombo-angiitis obliterans, the supervention of angina pectoris or coronary artery symptoms (in cases known to Dr. Parkes Weber) suggests that the intermittent claudication is caused by arterio-sclerosis (atheroma)—alone or superadded to thrombo-angiitis obliterans.

PERNICIOUS ANAEMIA AND BLOOD TRANSFUSION.

BY

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THE introduction of liver treatment for pernicious anaemia by Minot and Murphy completely altered the outlook in what was usually a fatal disease. Further research, stimulated by Castle's¹ work, by Sturgis, Isaacs, and Sharp,² and later by Wilkinson³ and by Conner,⁴ has demonstrated the value of hog's stomach in the treatment of this disease. More recently Renshaw⁵ published a case which relapsed on liver and which responded to hog's stomach (ventriculin).

There is a real danger, therefore, that the older methods of treatment may be relegated too much to the background. I have encountered cases that did not respond well to liver treatment, and in many of these the giving of arsenic and a blood transfusion has been largely responsible for tiding the patient over a dangerous period.

The most important point in giving a blood transfusion is correct grouping of the donor. I have sometimes had a little difficulty with Group III serum, as occasionally the clumping is slow and not very definite. In contrast, if clumping occurs in Group II serum, it is usually quick and leaves no room for doubt. It is a wise precaution to confirm all Group IV donors by using also a diagnostic Group IV serum. Brines⁶ recently stated that since adopting this as a routine measure no error in blood grouping has been detected in his laboratory during the past six years. While serious reactions rarely occur with Group IV donors, in my own experience fewer reactions occur when the donor is of the same group as the patient, but, although I prefer patient and donor to be of the same group, I never hesitate to use a Group IV donor, no matter to which group the recipient belongs.

In pernicious anaemia the giving of unsuitable blood is a very serious matter, because, even if the transfusion is stopped at the first sign of restlessness, backache, or dyspnoea, death may follow if the patient is very anaemic. Some time ago I was asked to do a transfusion on a patient with a very low red cell count. As he belonged to Group I—the universal recipient—no care was taken in selecting a donor. After about 40 c.cm. of blood had been given he became restless, and said that the blood was too strong for him. The transfusion was stopped, but the patient died eight hours later. He was grouped again before he died, and was undoubtedly a Group I, unless the particular tubes of serum used were at fault, which is unlikely.

Unmodified blood was used in all the transfusions referred to in this paper, the Louis Jubé syringe being employed. This instrument was demonstrated to me by Dr. Skinner of Sheffield, who described it in the *British Medical Journal*;⁷ since then I have done over a hundred transfusions with it, and I regard it as the most convenient method when a transfusion of 500 c.cm. or less is given. Above 500 c.cm. it is sometimes inclined to clot, but fortunately this is noticed early, and the transfusion can be discontinued. Reactions following the use of untreated blood are said by Brines⁶ to be far fewer and less severe than when citrated blood is used.

I wish to record here an unusual reaction which occurred when using a Group IV donor; the patient, who belonged to Group II, was suffering from pernicious anaemia. At

* On the occurrence of chronic leg ulcers in cases of congenital haemolytic jaundice, see F. P. Weber, *Practitioner*, 1920, cxxiv, p. 392; Gänsslen, *Klin. Woch.*, 1920, ix, p. 1308; *Deut. Arch. f. Klin. Med.*, 1925, cxlvi, p. 22.

† In this case there had likewise been cutaneous xanthoma, and it is referred to at some length by F. Parkes Weber, *Cutaneous Xanthoma*, etc., p. 14, 1924, London: H. K. Lewis and Co.

‡ Cf. A. S. Warthin, *Syphilis of the Medium and Smaller Arteries*, *New York Med. Journ.*, 1922, vol. 115, p. 69.

§ In this case, however, the subsequent microscopical examination (Professor R. Donaldson) revealed atherosclerosis as the arterial disease.