of success with any of these methods has been so small that spontaneous resolution might easily have accounted for the few cures following internal medication. No mention has been made of the numerous methods of treating warts by suggestion, and although it is admitted that sometimes the results obtained by such means are very dramatic, no reasonable explanation can be given as to how such influences work in a disease so definitely organic; but if the percentage of success could be ascertained it might compare with the incidence of natural spontaneous disappearance.

It is admitted that in some cases nothing short of total destruction of the wart by cautery or CO₂ snow or the removal of the entire lesion by curette will effect a cure.

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LYMPHANGIOPLASTY—THE FATE OF SILK

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In 1916 I gave an account in this *Journal* of a successful case of lymphangioplasty for brawny oedema of the legs, and wrote: "It is said that, whereas lymphangioplasty gives great relief in the brawny arm of cancer of the breast, in lymphatic oedema of the leg its results have not been satisfactory." Recently the patient I described then came to the Haywood Hospital. It is hoped that the follow-up of the case, with a few remarks about the theory of lymphangioplasty and the fate of silk buried in the human body, may be of interest.

Case Report

As a child, aged 13, in 1901 the patient was scalded on the lower parts of the legs and on the ankles and feet. Healing was very slow, and she was unable to stand for six months, and then had to learn to walk again. From the age of 16 to 21 she had a sedentary occupation as a telephonist. At 23 she became a barmaid, but after two years her legs became swollen, heavy, and painful, and she had to give up her work as it entailed long standing. In 1913, after treatment at two of the best provincial hospitals had proved unsuccessful, she came under my care.

On June 30, 1913, lymphangioplasty by Sampson Handley's method, using No. 12 woven tubular silk, was performed on both thighs and legs at the North Staffordshire Infirmary. The operation is easy, and special instruments are not required. Improvement was slow but continuous, and the legs regained their normal shape. When next seen, in July, 1916, she could walk sixteen miles in a day without any swelling of the legs or discomfort. The case was shown to the North Staffordshire Medical Society three years after operation.

On December 30, 1936, she was seen again as an out-patient because she had bruised her right ankle and a small ulcer which resulted was not quite healed. She is now 49;

and can walk miles; the legs are shapely and quite normal, except for the scarring left by the scalds. The case was shown again to the North Staffordshire Medical Society on December 10, 1936.

RADIOLOGIST'S REPORT

Dr. Kemp Harper reported as follows:

"When this patient was x-rayed faint opaque linear shadows, some fragmented, were seen in the soft tissues in the position where the silk threads were introduced twenty-four years ago. We decided that calcification had occurred in pieces of silk which still remained unabsorbed after this long interval; it was felt, however, that some proof of this was required. As a biopsy was refused by the patient, experiments were made. Long pieces of silk (unimpregnated) were attached to the legs of a subject and films taken; these showed no sign of opaque linear shadows. Similar pieces were then soaked in a weak barium sulphate solution, and areas of density were seen somewhat similar to those on the original films. Silk thread was obtained from the operating theatre of a fairly similar thickness, and this, to our surprise, was quite uniformly opaque. On inquiry we found that the silk had been sterilized in perchloride of mercury, and that the opacity of the silk depended on the length of time it had been in the sterilizing solution.

"As a result of these investigations we feel confident that portions of silk have persisted in the soft tissues for twenty-four years, and these pieces, unabsorbed, presumably as the result of walling off with dense fibrous tissue, are still visible. Two reasons can be advanced for this: (1) that the silk or surrounding layer of fibrous tissue has been rendered opaque by the deposition of calcium; or (2) that mercury has remained in the silk unabsorbed for this length of time. The latter reason cannot be definitely ruled out as injections of metallic substances into the buttocks in cases of specific disease are often seen on x-ray examination of the same region years after such injections have ceased."

Theory of Lymphangioplasty

Brawny oedema is due to lymphatic superadded to venous obstruction. A marshy field can be drained by lines of buried porous pipes, but unfortunately a perforated drainage tube buried in the human body becomes blocked by the organization of cellular elements and the coagulation of fluids which have entered its lumen. Sampson Handley (1908, 1910) made the brilliant and promising suggestion that silk threads would continue to drain by capillary attraction. He showed a section of a silk ligature which had been embedded in the tissues for ten years. "Though eroded at its surface the main substance of the thread is intact. Moreover, leucocytes are evidently unable to penetrate between the fibrils of the silk, for the interior of the thread is entirely free from cellular elements. Nor is there any microscopical indication of the coagulation of the body fluids in the interstices of the silk." Handley thought the capillary power was retained, but the question arises, Is there an impermeable sheath of fibrous tissue around the silk? This is the crux of the whole matter.

Lymphangioplasty was tried, and many early successes in the treatment of the brawny arm of cancer of the breast and in various simple lymphangiomas or oedemas of the arm were reported years ago. But Handley himself suspected that the operation would fail in the leg because it could not provide a motor force which would be able to overcome the full pressure of gravity in the lower limb.

The operation was tried, chiefly in Cairo (Madden, Ibrahim, and Ferguson, 1912), for elephantiasis of the legs, and always failed. The Cairo authorities gave histological details and made experiments, but their cases were not followed up long enough. They found that the trauma of the introduction of the silk and the irritation

it set up as a foreign body caused the formation of granulation tissue, which contracted, strangling all the channels within its grasp. "Finally, the silk thread is isolated like a long worm lying loose in an impermeable sheath." If this is true, it would appear that lymphangioplasty is unsound in theory, and can give only temporary benefit even in the arm. If drainage is effected and does persist, we can only suggest that the density of the fibrous sheath may depend upon the nature of the silk used and its mode of preparation, or that it remains incomplete (fenestrated) or otherwise permeable by fluids. (The hardest fibroids are living and moist, and evidently lymph percolates through them.) It hardly seems possible that the sheath is absorbed as time goes on, leaving the

A represents fragmented portions of silk visible on the radiograph in the soft tissues of the outer aspect of the leg; on the inner aspect (B) are faint opaque linear shadows.

silk to act as a drain. Lymphatic vessels and lymphatic glands can arise *de novo* in the human body, and possibly a collateral circulation of both lymph and venous blood develops; the blocked vessels may also regain their patency. All these matters call for discussion, however, for we cannot agree that the silk is destroyed: our radiographs prove the contrary.

The Fate of Silk

Thirty years ago surgeons used silk much more freely than nowadays. We were rather afraid of embedding long pieces, because if they became infected—from external or internal sepsis—trouble followed, and sooner or later the silk would be discharged. We were not certain to what extent the silk would be absorbed, or whether it would remain permanently embedded in a sheath of fibrous tissue, or persist in some altered form. It appears

that this uncertainty remains to this day; for instance, it is easy to find in the literature such statements as: "it is claimed that Japanese silk is absorbable"; and of silk saturated with mercuric biniodide and stored in liquid paraffin: "it is not absorbed, but is assimilated by the tissues forming the basis of a structure closely resembling tendon. It gives rise to no irritation and does not tend to work out." (In the case reported here Chinese twist impregnated with biniodide of mercury was used.)

We submit that our radiographs prove that some of the silk inserted in our patient twenty-four years ago has remained practically unaltered without causing the slightest trouble. Therefore, we cannot agree with the Cairo authorities who found—in healthy guinea-pigs after twenty-one days—that "the fibrils of the silk were slightly separated and broken up into strands by trabeculae of connective tissue passing inwards into the thread," and that "this process must eventually lead to its complete disappearance and the formation of a solid column of dense fibrous tissue along which no absorption of fluid of any kind can possibly occur." In some of their sections the silk was so loose that it fell out, and, therefore, could not have been invaded.

Conclusion

As regards the case reported, the perfect result cannot, after mature consideration, be claimed as due to the lymphangioplasty. It is not known why the brawny oedema came on so late, and the improvement after operation was "slow but continuous," whereas the benefit other surgeons have described has appeared soon after operation but has not persisted. We give all the credit to the *vis medicatrix naturae*.

My thanks are given to Dr. Kemp Harper for his excellent work, and to Dr. E. C. Myott of Stoke-on-Trent for kindly help and criticism. As it has been found impossible to reproduce sufficiently clearly the opacities seen on the original films prints have not been forwarded, but the films have been placed in the hands of the Editor of the *British Medical Journal* for his scrutiny.

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R. Castaneda-Palacios (*Dtsch. med. Wschr.*, July 23, 1937) has investigated the Chediak syphilis reaction at Professor Schittenhelm's hospital in Munich, applying it to 536 patients, seventy-eight of whom were syphilitic. The disease was tertiary in sixty-eight cases, secondary in five, primary in three, and congenital in two. Chediak's reaction was positive in seventy cases (89.7 per cent.), whereas the Wassermann reaction was positive only in fifty-six cases (71.7 per cent.). In none of the 458 non-syphilitic patients was Chediak's reaction positive, although they represented a wide range of diseases, including malignancy, infectious diseases, and disorders of metabolism. But the author agrees with Chediak himself in applying clinical and laboratory tests to doubtful cases. He describes a case in which the Chediak reaction was thrice negative, while the Wassermann reaction was at first positive. The patient was a man, aged 41, whose vague cardiac symptoms had suggested a diagnosis of vascular syphilis. The subsequent course of the case and a Wassermann reaction which was negative when repeated suggested that Chediak's reaction was the more delicate and reliable of the two.