above downwards until the remaining opening agreed with that of the duodenum.

5. The duodenum was then united to the remaining opening in the stomach with a similar suture. A continuous Lambert suture was then passed along the whole length of the first sutures.

The wound was closed with through-and-through silk-worm gut sutures and one layer of catgut sutures to the anterior layer of the rectus sheath. The portion removed gave a good clearance of the growth, except between the secondary deposit and the transverse colon, where the margin was rather narrow. The sutures joining the duodenum and the stomach put these organs on the stretch, and the tension was only partly relieved when they were allowed to fall back to the posterior abdominal wall.

The patient's condition was critical for two days; the pulse rose to 140 and the temperature to 100° F. There was some distension of the abdomen, but urine was passed; the extremities remained warm and there was no vomiting. Ultimately recovery was complete, and on March 20th Dr. Kinneir reported that Mr. A. was walking about, sleeping and eating as usual.

Description of Parts Removed.

The specimen measures $7\frac{1}{2}$ by $5\frac{1}{4}$ in., and consists of about two thirds of the stomach with half an inch of the duodenum. The cavity of the stomach is filled with a fungating mass of growth springing from a comparatively small area near the greater curvature. The "secondary growth" appears to be a direct extension of the primary growth, which has burst through the stomach wall and invaded the transverse mesocolon. There is an ample margin everywhere, except below the growth in the mesocolon, where the macroscopic growth comes as close as half an inch from the edge of the specimen. On microscopic examination the growth seemed to be a columnar-celled carcinoma undergoing colloid degeneration.

THE ASSOCIATION OF ERYTHEMA NODOSUM AND TUBERCULOSIS.

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MUCH has been written during the past five or six years on the association of erythema nodosum with tuberculosis. I need only mention here the work of Landouzy¹ in France, and articles by Marfan,² Sezary,³ Poucet,⁴ Moro,⁵ and an epitome of cases in the *American Journal of Medical Sciences* of March, 1912. The evidence brought forward has been partly the result of experimental investigation and partly the fruit of clinical observation, and it is to this last category that my remarks belong.

Reviewing a series of twenty cases of erythema nodosum that have been under my care since the beginning of 1907, I find that in six there were distinct evidences of tuberculosis.

These cases illustrate very well the various relationships that have been described as existing between tuberculosis and erythema nodosum—namely, that the rash may be a simple accompaniment of some chronic tuberculous lesion in lungs, joints, or glands, and is probably of toxic origin; or that erythema nodosum is an actual invasion of the skin by tubercle bacilli; or that it is not infrequently a prodromal symptom of an acute tuberculous septicaemia generally ending in fatal meningitis.

CASE I.

R. C., a girl aged $2\frac{1}{2}$ years, after two or three weeks' malaise developed sore throat, pains in the joints, fever, and erythema nodosum on the legs. This lasted for a week, but three weeks later she had a relapse, with further nodules in the thighs and on the mastoid process and occipital bone. With occasional brief intermissions the pyrexia continued for some months, and the child died in the ninth month of the illness with widely diffused caseous tuberculosis, finally succumbing to tuberculous meningitis.

CASE II.

A schoolgirl, aged 15 years, developed erythema nodosum during a school epidemic of influenza. There was no personal or family history of rheumatism or tuberculosis. The attack

was severe, the pyrexia lasting fourteen days. There was sore throat, giant urticaria, phlyctenules in the conjunctivae, and the sites of some of the nodules on the leg were marked some months after by depressed dimples. She was never a robust girl, and after the attack remained in poor condition. Seven months later she developed tuberculous pleurisy with effusion, from which recovery was protracted.

CASE III.

A girl, aged 10 years, who for some time had been losing weight and who was weak, became worse, and was kept home from school for three weeks. At the end of this time she developed pyrexia and erythema nodosum. When examined, early in the attack, she was found to have tuberculous glands in the neck and masses of enlarged glands in the abdomen. She made a good recovery. Both the mother and a brother had suffered from rheumatic fever, but the child had never had rheumatic symptoms.

CASE IV.

A woman, aged 53, who had been ailing for three months, was admitted into the Bristol General Hospital in February, 1908. She was a weakly subject, and was found to be suffering from phthisis at the apex of the right lung. Twenty-three days after admission she developed signs of erythema nodosum, rash, sore throat, and pains in the joints. The evening temperature was 99° F. throughout a stay of nine weeks in the hospital; at the termination of that time she was discharged.

CASE V.

A girl, aged 15 years, who had previously suffered from acute rheumatism, endocarditis, and chorea, was admitted to the Bristol General Hospital in 1912 suffering from pains in the joints, endocarditis, and pericarditis. She had at this time nodules of erythema nodosum.

A few days after admission she died. The severity of the attack was greater than would have been anticipated from the extent of the physical signs. Dr. Carey Coombs has very kindly given me his notes on the *post-mortem* examination, and of the microscopic examination made of the nodule excised from the leg. There were caseous tuberculous mediastinal glands in which tubercle bacilli were demonstrated, endocarditis, and haemorrhagic myocarditis, and pericarditis of such a character as to suggest that the fatal termination may have been brought about, not by a rheumatic but by a tuberculous infection. In the sections of the node there were giant cells of the type seen in tuberculosis.

Microscopical Examination by Dr. Carey Coombs.

Skin.—Corium: Normal.

Connective Tissue.—(a) Immediately beneath corium: There are many thrombosed capillaries, also groups of small, probably new capillaries. These are sometimes associated. Around these injured vessels are grouped various inflammatory cells; fibroblasts, chiefly in rings about the vessels, a few lymphocytes, and cells of the "endothelial leucocyte" class. The endothelium of the vessels, whether they are thrombosed or not, is proliferating. The impression left on the mind is that of a subsiding inflammation, presumably this is due to the prominent part played by the fibroblasts.

(b) At a greater depth than above: In the fibrous trabeculae, and extending thence into the fat, are tracts of similar but more active and recent inflammatory reactions, masses of cells of the endothelial leucocyte class are mingled with lymphocytes and in many spots imperfectly organized into capillaries. Two notable features are the damaged and irregular state of these new capillaries, and the almost total absence of fibroblasts. There are one or two loose collections of polymorphonuclear leucocytes. Two giant cells of the type seen in tuberculosis were also noted in this area; but without other of the elements of the granuloma, and without demonstrable acid-fast bacilli.

Tracts (a) and (b) were separated by quite a wide interval of connective tissue.

CASE VI.

A man, aged 51, who had had both testicles removed for tuberculous disease—one sixteen and the other twenty years earlier—was admitted to the Bristol General Hospital, under Mr. Wright, in 1913 for nasal obstruction due to polypi. A fortnight after his discharge he returned, and was again admitted, the nasal cavities being in an unhealthy condition, requiring proper douching. A few days later he developed a sore throat and a collar of erythematous patches round the neck. There was high fever, which continued for a week. Four days later he developed typical erythema nodosum on the legs, also spots on the arms and fingers—a condition which our dermatologist described as erythema multiforme of a nodose type. There were phlyctenules in both eyes. There was no tuberculous or rheumatic family history. The rash gradually faded, and he was discharged looking somewhat anaemic, but otherwise well.

Sufferers from erythema nodosum are very commonly cachectic looking children of the strumous type; and, although I have on several occasions obtained a positive von Pirquet's reaction, I do not think too great importance should be attached to this test. It is worthy of note, however, that Pollack found that 100 per cent. of cases of erythema nodosum gave a positive result; and Moro,

testing by his own method and von Pirquet's, only got four negative reactions in 30 cases of erythema nodosum.

Phlyctenular conjunctivitis and keratitis are of frequent occurrence in erythema nodosum. Lendon, in his work on *Nodal Fever*, says that they were present in 38 per cent. of the cases. This condition of the eye has a close relationship to tuberculosis. In an article on phlyctenulae, in the *BRITISH MEDICAL JOURNAL* of October 18th, 1913, Butler says: "I have been able to regard a tuberculous etiology as exceedingly probable in 70 per cent. of my cases. Professor Straub of Amsterdam thinks that 100 per cent. is nearer the truth."

Several observers have reported cases in which the hypodermic administration of tuberculin to tuberculous persons has given rise to an attack of erythema nodosum; and others who have excised nodules have noted that the sections show giant cells surrounded by epithelial cells, such as are to be seen in the section so kindly cut for me by Dr. Carey Coombs. In a contribution to *La Presse médicale* (November 19th, 1913) Professor Landouzy reports a case of erythema nodosum from which a nodule was excised. Tubercle bacilli were found in the histological sections, and another portion of the nodule when injected into a guinea-pig gave rise to local and general tuberculosis.

The evidence is too strong to permit our regarding the association of erythema nodosum with tuberculosis as merely accidental. It is far more convincing than the evidence formerly adduced to prove that the disease was of rheumatic origin—a view that is now rapidly disappearing. Personally, I am convinced that we have in erythema nodosum a distinct clinical entity,⁴ probably a specific infective fever; but it seems likely that we have included under the same name other erythematous nodular rashes—some which should be classed as rheumatic, some as erythema multiforme, and others as tuberculous, the last-named being evidence of a widespread and not infrequently fatal septicaemia.

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THE EXPERIENCES OF SURGEONS IN SCLERO-CORNEAL TREPHINING.

BY

R. H. ELLIOT, M.D., F.R.C.S.

IN the preface of the first edition of my work on *Sclero-Corneal Trephining in the Operative Treatment of Glaucoma* I wrote:

I desire to lay my case fully and freely before the medical profession. At that bar we must one and all be tried, and I for one have no doubt that the ultimate verdict, even though it may be delayed, will be the just and right one, be it what it may.

Since those words were written a very extraordinary volume of evidence on this subject has been furnished. Within the short space of four years the operation of sclero-corneal trephining has made such a powerful appeal to the medical profession that it has been tried in every civilized country. Scientific assemblies, from the great International Congress in London downwards, have discussed it in all its bearings; the medical press has been full of reports of and opinions on it; and men of world-wide reputation have published their statistics, and have thereby arrested the attention of the profession. The aim of this article is to collect, even though in a condensed form, some of this valuable testimony. For the most part comment or criticism on my part would be out of place, and the unadorned tale of great workers will carry more weight than any embellishments that I can add to their story. Hence the bulk of the article will take the form of short extracts from the work of such surgeons. I do not fail to recognize that behind all this there lies a force much greater even than the individual opinions of a number of great ophthalmologists—a force comparable to that of a swollen river fed by innumerable rivulets—the force of widespread medical opinion. The number of men

in many parts of the world who are quietly and unobtrusively trephining for glaucoma is legion—men who say they have done only a few cases, and who consider their evidence not worth having on account of the individual smallness of their statistics, but who, none the less, write and speak of the wonderful results they have obtained, and of the comfort it has been to them to find an operation so safe, so easy, and so satisfactory for a condition which previously reduced them to hopelessness. Surgeons such as these will not lightly give up the method; they are the backbone of its permanence, and, though it is not possible to place all their valuable evidence on record, it is none the less fully and deeply appreciated.

Wallis¹ collected the statistics from the case sheets of 91 patients, operated on in Moorfields Hospital, and wrote:

I have excluded all but primary chronic glaucoma patients, and amongst these were not a few for whom the prognosis was very grave—cases that had failed to receive permanent benefit from previous operative methods (other than Elliot's), and absolute glaucomata; also all operations are included, whether performed by the honorary staff, by senior house-surgeons, or by clinical assistants. Of 91 patients suffering from primary chronic glaucoma, upon whom Elliot's operation has been performed, those who have developed repeated *plus* tension within a year of the operation give a case percentage of 9.8. The operation percentage of failures amongst these patients is 15.3—this larger figure is due to the cases that have failed to be improved by more than one operation in the same eye, and from failure in the two eyes of the same patient when this occurred.

It is obvious that the test of the value of trephining here dealt with is a very severe one, by reason both of the nature of the cases accepted for operation, and of the number and varying experience of the operators.

Stock,² of Jena, published the results of 118 trephinings for glaucoma, with eighty-eight good results (74.6 per cent.). Of the poor results fourteen were in operations undertaken for glaucoma absolutum, while the rest had vision not above $\frac{1}{80}$ before operation. This is a striking confirmation of what I have long said—namely, that our failures lie in the group of cases which are late in seeking relief. Vision improved after operation in 39.8 per cent., remained the same in 34.1 per cent., and decreased in 25.6 per cent.; in eight of those which showed a decrease this was due to the maturation of a previously existing cataract, in one it was due to haemorrhage into the vitreous, and in five to iritis.

Meller,³ of Vienna, has recently published a report based upon 389 Lagrange operations, and 178 sclero-corneal trephinings supported by the microscopical examination of a number of globes removed after failures. He states that "the great advantages of the Elliot operation is that its technique is so much more easy." In not a single case of the 178 was there an injury of the lens. He compares the two operations, dividing his cases into two groups—namely, (1) good results, Lagrange 69 per cent., Elliot 72 per cent.; and (2) bad results, Lagrange 8.4 per cent. and Elliot 2.4 per cent. "Complications, such as lens opacities, severe irido-cyclitis with atrophy of the globe, expulsive haemorrhage, etc., not at all infrequent after the Lagrange operation, are scarcely met with after trephining." He finds a tendency after both operations for the iris to block the wound, and is in favour of "a complete iridectomy in the Elliot operation." The percentage of vitreous loss is 3.4 per cent. after the Lagrange and 2.8 per cent. after the Elliot, and he finds that "vitreous prolapse after the Lagrange is a much more serious complication than the escape of a bead of vitreous from a small trephine opening." To show the genesis of relapses, he compares the figures found in the two operations: (1) After total iridectomy, Lagrange 9.3 per cent., Elliot 7.5 per cent. (2) After peripheral iridectomy, Lagrange 11.8 per cent., Elliot 18.7 per cent.; and (3) without iridectomy, Lagrange 20 per cent., Elliot 23 per cent. He therefore inclines to the view that iridectomy is more important than Lagrange or Elliot consider it to be.

With an equally high percentage of excellent results, the Elliot operation has a much smaller percentage of bad results than the Lagrange. Further points in its favour are the considerably easier technique and the much smaller number of complications, especially in the severe forms of acute and absolute glaucoma. With the Elliot operation only 15.4 per cent. of the absolute glaucoma cases ended badly, while 38 per cent. of such cases were lost entirely after the Lagrange operation.