cotton-wool and a pin, but it was not marked. There was no facial weakness, and no paresis of the ninth, tenth, eleventh, or twelfth left cranial nerve. There was no retropharyngeal swelling. Cerebration was apparently normal. There was no stiffness of cervical muscles, and abdominal reflexes, knee-jerks, plantar reflexes, etc., were all normal. The fundi were examined by Mr. William Wyllys and reported normal.

The further progress of the case was as follows:

December 25th: There was pain during the night, but the patient is easier this morning.

December 26th: Pain was very severe during the latter part of yesterday and all the night in spite of the narcotics. She is now in great pain. Begs for something to be done. Bulging of Shrapnell's membrane has increased and is now bright red. Inflammation is spreading down the posterior segment. Deafness on the left side has increased, and the whispered voice can now only be heard at 3 inches. Meatal tenderness is very marked. There is definite periosteal thickening over the mastoid and slight tenderness. Other signs as before. The temperature is 99.2° F. and above normal for the first time since admission.

Operation.—Paracentesis was first performed. Schwartz's operation revealed a small granulation in the antrum, but no pus was seen. The tegmen antri was then removed. The dura was not under tension, and the surface was finely granular. The cavity was packed with bipped gauze.

December 27th: Patient has had a very good night without any narcotic. She states that aural pain and neuralgia have completely disappeared, but there is slight pain round the left eye. Diplopia as before.

December 28th: The pain round the left eye is rather worse; no return of other pain.

December 29th: First dressing, under nitrous oxide anaesthesia. The gauze wick which had been placed in the meatus was soiled with a little pus. Packing from the wound was fairly clean. She has had two good nights.

December 30th: Patient says she has been easier since the dressing was done yesterday, but still has some pain round the left eye.

December 31st: No pain in the ear or temporo-parietal region, but she has had more pain in the left eye, supraorbital region, and left cheek. Diplopia is still present, but there seems to be slight movement in the left external rectus.

January 3rd: She has had a few shooting pains in the left ear and temporo-parietal region.

January 8th: The pain round the eye has been improving gradually. She now has very little except on waking in the morning. There have been no more temporo-parietal pains. She sleeps well at night and often by day. The cavity is granulating slowly.

January 16th: There has been no pain round eye for several days, but she still wears an eye-shade in the evening as artificial light worries the eye.

January 26th: The mastoid cavity is now filling satisfactorily with healthy granulations. The patient is leaving the ward to-day and will attend daily for dressings. Eye movements are as before.

March 1st: Complete healing of the wound has been very slow, but she ceased attending daily three weeks ago, since when she has been attending Dr. Blake, who states that he first noticed return of movement in the external rectus on February 22nd. There is no diplopia now, and all movements of the left eye are as good as those of the right.

In the treatment of this case two points are especially open to criticism.

1. Paracentesis alone might have been the only operative treatment necessary, and if the pain had not been relieved by this the Schwartz operation could have been performed later. This course was not adopted on account of the excessive pain the patient was then suffering, and had suffered all the previous night. The indications for mastoid operation *per se* were slight, but it seemed unwise to risk another night of such severe pain where there was the slightest doubt as to the condition of the mastoid antrum.

2. No lumbar puncture was performed. Reports seem to agree that not only is there no macroscopic change in the cerebro-spinal fluid in these cases, but there is seldom any change to be found on pathological examination. In addition, as the hospital has no pathological department an examination of the fluid would have been difficult to obtain.

Facial neuralgia was present in the early stages of the illness, and although the operation completely relieved the severe temporo-parietal pain, the patient complained for some time afterwards of pain of lesser intensity round the left eye and in the left cheek. The anatomical explanation of the syndrome would seem to offer an easy solution to this. After piercing the inner layer of the dura mater the sixth nerve lies for a few millimetres with the inferior petrosal sinus in between the two layers of the dura mater at the tip of the petrous bone in what is known as Dorello's canal. This canal is bounded below by the petro-sphenoidal suture, above by the posterior clinoid process and petro-sphenoidal ligament, internally by the dorsum sellae, and externally by the apex of the petrous bone.^{1 2} The

Gasserian ganglion lies in the trigeminal impression on the antero-superior surface of the petrous bone near its apex.

The syndrome is said to be due to a serous extradural inflammation implicating the sixth nerve in Dorello's canal. Hence from the proximity of the Gasserian ganglion it would be expected that the fifth nerve involvement would not be uncommon. This involvement has been stressed by Rimini,³ and was marked (with slight photophobia) in the case reported by Hamilton and Kerr.⁴

There was no involvement of any cranial nerve other than the fifth and sixth, and there was no homolateral retropharyngeal swelling, as occasionally occurs and was noted by Leitch.⁵

The notes of this case were submitted to Mr. G. J. Jenkins for his opinion, and I am exceedingly indebted to him for his comments. He considered the case to be a typical Gradenigo's syndrome, and he particularly emphasized the fifth nerve distribution of the pain, which he states is more common than is generally recognized. I have to acknowledge my thanks to Dr. V. H. Blake for permitting me to treat the case, for additional details in the history before admission to hospital, and for valuable criticism in the presentation of these notes.

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- ⁴ E. Burt Hamilton and J. A. Kerr: *Journ. of Laryngol. and Otol.*, vol. xliii, p. 43.
- ⁵ J. W. Leitch: *Ibid.*, vol. xlii, p. 457.

TREATMENT OF ACTINOMYCOSIS.

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In an article published in the *British Medical Journal* on March 6th, 1926 (p. 418), I gave an account of four consecutive cases of actinomycosis which had been rapidly cured by small doses of tincture of iodine administered in milk. I believed at the time that iodine given in this way was in a colloidal state. When milk is added to tincture of iodine a point is reached at which the mixture becomes colourless and tasteless. This result is more rapidly attained when cream is substituted for milk, and it appears that the iodine unites with the cream to produce an iodized fat.

In this connexion the observations of Dr. Warwick Preston¹ are of great interest. He records two cases of actinomycosis of the lung which improved rapidly after the injection into the trachea, for diagnostic purposes, of lipiodol—an iodized oil. A subsequent course of iodine and milk completed the cure. This suggests that various iodized fats may have a similar specific action upon actinomycosis.

Black mycetoma is a disease produced by an organism similar to the ray-fungus, and I have received from India reports of two cases which were cured by iodine and milk, and of one old-standing case of "Madura foot" which began to improve rapidly as soon as this treatment was instituted.

Since the appearance of my first article four additional cases of actinomycosis have been under my own care, all of which have been cured.

CASE I.

A man, aged 42, in July, 1925, was operated upon at another hospital for appendicitis. The wound was drained, and one month later he was discharged from hospital with a sinus at the site of operation. In September of the same year he was readmitted, and further abscesses were drained in the abdomen and right loin.

He first attended the Bristol Royal Infirmary on February 16th, 1926; he was then extremely emaciated and in constant pain. Hard masses filled the right side of the abdomen and extended across the epigastrium to the splenic region. Several sinuses were present in the right loin and the right side of the abdomen; from them there was a copious discharge of pus containing typical sulphur granules, and an immediate examination confirmed the presence of actinomycetes. He was given tr. iodi sine iodidi, minim v, thrice daily in milk until March 6th, when he was admitted as an in-patient. By this time all his pain had vanished; he could eat anything, and he had put on nearly a stone in weight. The masses in the abdomen had almost vanished, but there was still some thickening around one abdominal scar. Three sinuses were still present, but there was little discharge from them, nor could actinomycetes be identified any longer in the pus. He was discharged on March 17th.

He was readmitted in October, 1926, as three sinuses refused to heal; they all communicated, and were probably due to a deep infected ligature. They eventually closed after being injected with various substances, such as brilliant green and crystal violet.

CASE II.

This patient, also a man aged 42, was admitted to the Bristol Royal Infirmary on September 17th, 1927. Three weeks previously he had had a right lower molar tooth extracted on account of pain and swelling in the jaw. Between this time and his admission he had had numerous anaesthetics for the extraction of other teeth, the exploration of his lower jaw, and the opening of sundry abscesses of the face and neck.

On admission the whole of the right side of the face was greatly swollen; large fluctuating abscesses extended from below the right angle of the jaw to the right temporal region, and he was unable to open his mouth. The abscesses were opened freely, actinomycetes was identified microscopically, and he was put on the usual treatment. On October 12th he was discharged healed. Some thickening persisted in the tonsillar region, and it was three months before this had disappeared completely. He has remained well ever since.

CASE III.

A man, aged 23, was admitted as a case of probable actinomycosis on April 4th, 1927. He had a hard swelling over the left side of the jaw, and a history of recurrent abscess formation for seven months previously. The abscess was opened and the pus examined with a negative result. He had been put on the iodine treatment, but in view of this finding, and the fact that the abscess healed rapidly, this was discontinued, and he was discharged.

He returned with another abscess in September, and this time actinomycetes was identified. He was put on treatment again, and the lesion slowly healed, leaving a deep depression in the jaw where bone had been destroyed. He has remained well ever since.

CASE IV.

This case, that of a youth aged 17, was very similar to the last. He first attended the Royal Infirmary on October 8th, 1927, with an indurated swelling over the left side of the lower jaw. This soon broke down to form an abscess, the pus from which was found to contain actinomycetes.

He was put on the same treatment, and his wound rapidly healed. He was last seen on December 13th of that year, but he writes, in answer to an inquiry, to say that he has had no recurrence of the trouble since that date.

REFERENCE.

¹ *British Medical Journal*, December 29th, 1928, p. 1172.

A CASE OF ULCERATIVE ENDOCARDITIS OF PUERPERAL ORIGIN.

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THIS fatal case of puerperal sepsis is interesting because of the almost total absence of pelvic symptoms or signs, and because there were no clinical signs suggestive of heart lesions such as were found at necropsy.

Clinical History.

A primipara, aged 23, was confined in an outlying district on July 21st, 1928; the labour was normal except for early rupture of the membranes. No instrument was used, and there was no trauma. Up to about the tenth day, when the patient was reported by her mother to have had a rigor, the puerperium was normal. She got up on the eleventh day, but further rigors were reported to have occurred on the seventeenth and twenty-fourth days. On the twenty-ninth day she came to Barnsley to her mother's house, and on the thirtieth day had another rigor.

One of us (G. R. M.) was called in on the thirty-first day, and found the following conditions: the temperature was 99° F. and the pulse 120; the uterus was fully involuted, retroverted, and free from tenderness, and there was no uterine discharge. The urine was normal, and no other abnormal signs were found. The retroversion was replaced. On the night of the thirty-third day the patient became orthopnoeic, her temperature rose to 102.6° F., and her pulse to 140. On examination a gallop rhythm was found at the heart; but no enlargement or murmurs were detected. The bases of both lungs were dull on percussion, and auscultation revealed moist sounds and friction rub. An injection of atropine, strychnine, and digitaline was administered. On the thirty-fourth day we both saw the patient in consultation. She was obviously suffering from toxic absorption, but no other abnormality was found. The lungs were now resonant and free from abnormal signs. Material was taken for an agglutination test, which proved to be negative. From now on the patient had numerous rigors. On

the thirty-seventh day she was admitted to hospital. On examination we found that the heart was not enlarged, and there were no murmurs to be heard. There was a reduplicated first sign at the apex and the left border of the sternum. Occasionally sibilant rales were heard in the lungs. The pelvic organs were apparently normal, except for a slight, non-offensive uterine discharge. The patient was given 25 c.cm. of antistreptococcus (puerperal) serum. She was restless that night, and on the morning of the thirty-eighth day she collapsed. She was orthopnoeic, but with stimulant treatment made a partial recovery; her temperature, however, was 107° F. She remained in a typhoid state until her death on the fortieth day. Towards the end the patient's urine was highly coloured with urates and loaded with albumin. Her temperature varied from 103° to 107° F., her pulse became uncountable, and her respiration rate varied from 45 to 75.

Post-mortem Findings.

On September 1st, 1928, a *post-mortem* examination was made. Apart from tumidity of the abdomen there were no external signs of disease.

Abdomen.—There were no signs of peritonitis, and the bowel, though considerably distended, was not ulcerated. The liver was enlarged, passively congested, and showed signs of cloudy swelling; there were no abscesses. The spleen was enlarged, congested, very friable, and free from abscesses; the Malpighian bodies were not visible. The kidneys were pale, the cells being in a condition of cloudy swelling; there were no signs of abscess formation. The uterus was well involuted, the mucous membrane being soft and friable, and slightly septic. The os was slightly patulous, and a recent blood clot was found in the body of the uterus. There was nothing else abnormal in the pelvis.

Lungs.—These were in a state of hypostatic congestion, and at both bases there were recent pleural adhesions to the diaphragm. There were no signs of infarct or abscess formation.

Heart.—The pericardium contained about 3 oz. of greenish fluid with some shreds of fibrin. On the anterior epicardiac surface

there was a serous patch about the size of a threepenny-piece. The heart weighed 7½ oz.; its muscles were rather pale and flabby. The left auricle and left ventricle were normal. The mitral valve showed signs of early endocarditis, with the formation of pink nodules on its ventricular surface. The aorta and coronary arteries were healthy, but the aortic valves showed signs of endocarditis. The papillary muscles of the right ventricle were friable and inflamed. There was (as shown in the photograph) a large suppurating blood clot, weighing 126 grains and measuring 6.3 by 2.2 cm., firmly attached to the anterior cusp of the tricuspid valve. The cusps of the tricuspid valve were greatly thickened and in a state of necrotic ulceration. The right auricle and the pulmonary valve were apparently healthy, but attached proximally to the left posterior cusp of the tricuspid valve, and passing through the pulmonary valve into the pulmonary artery was a thin, recent *ante-mortem* clot, 8 cm. long, and bifurcated at the distal end.

COMMENT.

The clot attached to the tricuspid valve was wedged in the valve ring, and we considered that it was probably acting as a ball valve and had been present for two or three weeks. Of special interest were the site of the chief cardiac lesion and, apart from the reduplicated first sound, the absence of abnormal signs. At no time did the patient complain of pelvic or cardiac pain, nor could any previous history of rheumatism or tonsillar or cardiac trouble be elicited.

We are indebted to Dr. T. E. Francis and Dr. D. H. Hubbs for permission to publish this case.