over the cheek, redness and tenderness of the upper gums, bulging of the inner wall of the antrum into the nasal cavity, etc.

B. Certain Signs.—The only pathognomonic sign is demonstration of pus in the cavity itself. This is possible by three methods: (1) Probing the natural orifice of the sinus through the middle meatus, a proceeding which has not been very successful in my hands; (2) puncture through the alveolus of an extracted tooth; (3) puncture through the inferior meatus of the nose.

Having had one's attention drawn to the probability of the presence of an empyema of the antrum by several of the probable signs above mentioned, especially the first three, further steps are necessary to clear up the case. If the symptoms are very distinct, particularly the presence of foetid pus and Fränkel's symptom, combined with dulness on transillumination, and the existence of a decayed first molar on that side, it may be advisable, in order to avoid a second operative procedure, to make a puncture through the alveolus after extraction of the tooth, and aspirate, blow, or syringe through at once; but in other cases, certainty is best arrived at by exploratory puncture through the inferior meatus. This is a method which I have found very useful; it was advocated as long ago as 1889 by Moritz Schmidt,¹ who employed a hollow curved needle attached to a hypodermic syringe. After trying this, and finding that it gave insufficient power, I had a hollow curved needle attached to a firm handle made, but within the last few months I have given this up in favour of a straight trocar and cannula such as is used by Grünwald,² finding this more satisfactory, as it would penetrate when the curved one would not.³

The method of employment is as follows: The nasal cavity having been very carefully cleaned with wool mops, especially in the region of the hiatus semilunaris, a long-shaped wool pellet soaked in 20 per cent. solution of cocaine is tucked well into the inferior meatus. After its removal the trocar, which has been previously carefully sterilised, is introduced, under good illumination, into the inferior meatus (at its upper part) until the point occupies about the junction of the anterior and middle third of that canal. By turning the butt end of the trocar sharply towards the septum, and making pressure on the instrument in a horizontal direction, it penetrates, with more or less ease, into the antrum. The trocar is then removed, leaving the cannula *in situ*. A small aspirating syringe is next fitted to the cannula, and suction made, the point of the cannula being at the same time tilted in a downward direction. If this fails to give pus, I employ Grünwald's plan of attaching a rubber bag to the cannula, and blowing air through it, whilst at the same time the region of the middle turbinated body is inspected through a speculum, so that any discharge blown out of the antrum can be seen. If there be any liquid in the antrum a moist bubbling is also heard by the surgeon. A positive result may be obtained by this method when aspiration alone fails to yield any discharge.

A further manoeuvre, of which I have not had much experience yet, but which I think may be of service, is to aspirate after some air has been blown into the cavity; the air having made an emulsion with any pus present may facilitate its aspiration, when the point of the cannula did not reach below the level of the pus in the first instance. Aspiration may also be facilitated, I have found, by tilting the head well back, so that the point of the trocar occupies the lowest part of the antrum. No liquid is introduced into the antrum.

I have employed this method 26 times since last July, when, through the kindness of Dr. Grünwald, I became acquainted with it.⁴ In no instance in these 26 punctures have I failed to enter the antrum. In one case where the curved instrument was unsuccessful, the straight trocar entered easily. I have seen no bad results from the exploration. Once, some years ago, the syringe on aspiration filled with blood, but no symptoms ensued, although I saw the

patient three months afterwards. In the majority of the 26 punctures (17 of which have been in hospital practice) the result has been negative, but this is because in clear cases I have often proceeded directly to the opening through the alveolus.

Grünwald recommends repeated puncture when the result is negative and the symptoms are marked, on the supposition that the cavity sometimes contains pus, at others not. I have not yet done this, although it may on occasion be necessary. I have always found local anaesthesia sufficient for what does not seem a really painful proceeding, but it could be done under gas if necessary.

There are other points which might be gone into, such as the comparative value of the probable signs and the differential diagnosis of abscesses of the various sinuses.⁵ It will suffice to say here that in cases of evident ethmoidal empyema the diseased parts of the ethmoid (at any rate as far as they cover the hiatus semilunaris) must be cleared away first before an exploratory puncture of the antrum is made, otherwise if a small quantity of pus is blown out by this method, one may still be in doubt as to which of these two sinuses it was in. The determination, in any given case, of what point the discharge comes from is often so fraught with difficulty that any simple method which assists in forming a definite diagnosis is to be valued. I have therefore brought this method forward, leaving further details of the subject for a future occasion.

A CASE OF ACTINOMYCOSIS OF THE ORBIT, WITH A SUMMARY OF SEVEN OTHER CASES OF ACTINOMYCOSIS.

By W. B. RANSOM, M.A., M.D., M.R.C.P.

Physician to the General Hospital, Nottingham.

THE following is the seventh case of actinomycosis recognised during life in the Nottingham district within the last six years. It is possible that more cases may have occurred, but in these seven I have had the opportunity of observing the spherules of the ray fungus, either in the pus discharged or in tissues removed by operation.

The frequency with which this so-called rare disease has of late been met with in this district appears worthy of record, and I therefore append to the report of this last case a list of the others, details of which have been kindly supplied by the gentlemen under whose care they were.

Mrs. W., aged 32, an inhabitant of Nottingham, was first seen by me in consultation with Dr. Hunter on November 1st, 1894. She had then been suffering for six weeks from intense pain in the right temple and eye, and for the last week there had been slight ptosis and some limitation of the movements of that eyeball.

Until the present illness, the patient had enjoyed good health, and there was nothing in her personal or family history to suggest syphilis or tubercle. In the July previous, she had been confined of a healthy child, and had afterwards gone to stay with friends in the country near Newark, where, as we learnt afterwards, she had assisted at the harvest.

Six weeks before the date of my visit, she had been suddenly seized with severe pain in the right eye, and this pain had continued ever since. She had all the teeth in the right upper jaw drawn without relief to the pain. As Dr. Hunter did not see her at that time, we do not know what was the condition of the teeth, but Mrs. W. said herself that they were not particularly bad, and was not inclined to attribute her pain to them.

On November 1st, Mrs. W. appeared pale and worn with suffering, but her mental faculties were intact. She complained of intense pain in the right eye and temple, and there was cutaneous hyperaesthesia all over the scalp, but none on the face. The temple could not be tested in this respect, owing to the application of a blister.

The right eyelid drooped slightly, and the movements of the right eyeball were somewhat limited in all directions, but it was not more prominent than the left. The pupils were equal, both fundi were normal, and the tension of both bulbs appeared normal. Nothing abnormal could be found in the ears, nose, or jaw.

On November 9th, there was distinct bulging forward and some redness of the right eyeball, but no enlargement of veins, no iritis, and no change in the fundus or media. Vision good. The diagnosis was now made of retro-orbital inflammation or growth, and an exploratory operation suggested. The patient was seen soon after by two surgeons on two separate occasions, but by this time there was such marked bulging of the temporal fossa that they both considered the case one of sarcoma and unsuitable for operation.

I did not see Mrs. W. again until the beginning of January, 1895, when Dr. Hunter sent her to see me at the hospital. In the interval she had had much morphia and some iodide of potassium and mercury. The

¹ Diagnosis and Treatment of Diseases of the Antrum of Highmore, *British Journal of Dental Science*, March 1st, 1889.

² *Die Lehre von den Nasenerkrankungen*, 1896, second edition, p. 192.

³ The trocar is 11 centimetres long and 2 to 2½ millimetres thick (Down Brothers, London). It is therefore thicker than Lichtwitz's.

⁴ My previous punctures, without the blowing through, date from 1889.

⁵ The chance of a tumour being present must also be taken into account.

pain was now somewhat less intense, and there was much less exophthalmos and less swelling of the temporal fossa. At the outer canthus of the right eye there was a small opening of the skin, through which a probe could be passed for 2 inches towards the apex of the orbit, and from which a scanty, thin, purulent discharge escaped.

On January 17th, Mrs. W. became an in-patient, and on squeezing out of the sinus some of the discharge, I found in it the characteristic spherules of actinomycetes. They were all of a pale yellow colour, no dark ones being present. Clubs were easily seen in the fresh specimens.

At this date, in addition to the old pain, Mrs. W. also complained of pain in the left eye and in the left occipital region. The movements of the right eye had returned so as to be nearly normal, but there was still slight ptosis and swelling of the right eyelid. The pupils reacted normally, but the right one tended to be a little larger than the left. There was no facial, lingual, or limb paresis. Mentally she was depressed, but otherwise appeared normal. Knee jerks normal. For treatment, potassium iodide in increasing doses was ordered, and the sinus was daily syringed out with a weak solution of iodine. The discharge remained scanty and thin, and at the daily dressing only two or three spherules could as a rule be squeezed out.

The temperature, which remained about 99° F. for the first week, rose to 102° at the end of the second, and the general state became gradually worse. On February and the mouth of the sinus was enlarged by Mr. Hogarth, house-physician, and by an incision in the temporal fossa (where no inflammatory tissue was found), a lateral opening behind the external angular process made into it. Drainage tubes were put into each opening, and the sinus was several times scraped with a sharp spoon. The sinus still appeared to be shut off from the main contents of the orbit, and a probe touched bare bone at its apex. In spite of free drainage and large doses of iodide of potassium (75 grains daily by February 15th), the patient grew worse. The temperature remained continuously high (100° to 103°), mental irritability and confusion set in, there were scattered pains in the head and limbs, and the visual power of the right eye became impaired.

On February 20th she began to be deaf, first in the left ear and then in the right, but there were no signs of otitis media.

On the 26th the physical weakness was so great that she could not stand alone; there was loss of knee-jerks and slight internal strabismus of the left eye, and the patient was very drowsy and dull of understanding. Still no optic neuritis. She became gradually comatose and died on February 28th.

NECROPSY (Head only).

On removing the right eyeball the greater part of the cavity of the orbit was found to be healthy and separated from the sinus along its outer wall by a layer of firm fibrous tissue. On the floor of the sinus, about an inch from its mouth, was a small opening leading directly downwards, and a probe passed through this goes down into the mouth, so as to be felt under the mucous membrane of the upper jaw, near where the first molar tooth had been. It could not be pushed through into the mouth, nor could any communication with the antrum be found, but when the antrum was explored from the nasal cavity it was found to contain some pus. At the inner end of the sinus was a small patch of roughened bone close to the sphenoidal fissure, but there was no visible orifice leading into the cranial cavity.

On opening the skull the convexity of the hemispheres appeared healthy, but, on raising the frontal lobes, pus and lymph were seen surrounding the infundibulum and ocular nerves. The pus could be traced for about an inch up either Sylvian fissure and backwards over the lower surface of the pons, from whence it crept up to the right lobe of the cerebellum, which adhered to the thickened tentorium in places. Lymph was also found in the anterior part of the vermis, and there was a small abscess (1 centimetre in diameter) involving the superior peduncles, and a similar one in the right lobe of the cerebellum. The anterior part of the right temporo-sphenoidal lobe was congested, but the cerebral hemispheres were otherwise free from disease. The petrous bone and the great wing of the sphenoid showed no infiltration, but there was a red spot on the dura mater, close to the right sphenoidal fissure. Both right and left cavernous sinuses had their walls infiltrated with pus containing spherules of actinomycetes, and the pituitary body was riddled with them, as was the bone of the sella turcica.

REMARKS

The necropsy was of great interest, as indicating the probable mode of infection of the orbit and brain. The fact of the sinus leading from the orbit to the gum of the upper jaw makes it probable that the ray fungus originally lodged in or near a tooth, as it has so often been found to do. Although the patient gave no history of especially bad teeth, it is hardly likely she would have had them so early extracted unless they had shown signs of decay. That the socket of the tooth should not show signs of disease when the patient came under observation is quite compatible with this view, inasmuch as it is a well-known habit of actinomycotic inflammations to heal in one part while they spread in another. It is not improbable that the fungus was carried into the system on an ear of corn chewed at harvest time. Having reached the orbit, it crept along its outer wall and in the wall of the right cavernous sinus to the base of the brain, ultimately setting up meningitis and small abscesses, and burrowing through the pituitary body and sella turcica to the cavernous sinus of the left side. In all probability the disease had reached the cranial cavity before admission into hospital.

The swelling of the temporal fossa is difficult to account for, as neither during life nor after death was any inflammatory mass found there. It is, however, common for the acti-

nomyces to cause hyperæmia over a very wide area. Although the jaw is probably in man as in cattle the commonest seat of the disease, actinomycosis must be very rare in the orbit. I have found, however, in the *Centralblatt für Pathologie*, No. 1, 1895, references to two cases in which the inferior lachrymal canal contained the ray fungus.

In regard to treatment in the present case, it is obvious that operative measures could only have been successful if undertaken very early in the case, before the invasion of the cranial cavity. It must also be admitted that iodide of potassium failed to subdue the disease, although possibly if given in large doses at an early period it might have produced an effect. From a consideration of this and other cases it is clear that whenever possible the treatment of actinomycosis should be both medical and surgical. The free administration of iodide of potassium should be supplemented by early complete scraping of all inflamed tissues. That the drug has a beneficial effect on the disease appears to be proved by the experience of veterinary surgeons, as well as by such cases as that of actinomycosis of the prostate treated by me in 1891, and that in which the thoracic wall was diseased, reported by Netter in 1893. But it would also appear that the specific effect is distinctly less marked than it is in syphilis. One of the cases (v) to be shortly mentioned illustrates this point. I now give a list of six other cases which have occurred in this district during the last six years. It is a somewhat curious fact that human actinomycosis should apparently be more frequent in the neighbourhood of Nottingham than in other parts of England; for although it is not very uncommon in cattle hereabouts, yet the bovine disease is not, so far as I can learn, more frequent than in Norfolk, Lincolnshire, or some other counties. Probably if attention were directed to it the malady would be met with more frequently elsewhere.

CASE II. *Perityphlitis*.—Reported by Dr. W. H. Ransom (*Med.-Chir. Trans.*, 1892). Patient was a medical man living in Nottingham. Illness began October, 1888. Mode of infection unknown. Treatment: Incision and drainage. Died June, 1889.

CASE III. *Actinomycosis of the Face and Neck*.—Reported by Mr. A. R. Anderson (*Med.-Chir. Trans.*, 1892). Patient an agricultural labourer from Vale of Belvoir. Illness began November, 1889. Had eaten corn at harvest time. Treatment: Free incision and scraping. Recovery.

CASE IV. *Actinomycosis of the Rectum and Prostate*.—Reported by Dr. W. B. Ransom (*Med.-Chir. Trans.*, 1892). Patient, a man, living at Mansfield. Illness began September, 1890. Had eaten wheat and barley in June. Treatment: Intestinal antiseptics and iodide of potassium. Recovery.

CASE V. *Actinomycosis of the Cheek*.—(Unpublished). Under the care of Dr. Herbert Owen Taylor, General Hospital, Nottingham. The patient was a woman living at Ilkeston. About May, 1891, she began to have "toothache" in the right upper jaw. A painful swelling slowly formed on the cheek. In January, 1892, she was admitted into hospital, and the diseased tissues twice thoroughly scraped. Discharged March 30th, 1892. She is now (May, 1895) perfectly well, although the face is much scarred. She had been in the habit of occasionally eating wheat, barley, and Indian corn, when feeding her fowls. The actinomycetes in this case resembled the bovine form, in that the clubs stained blue with gentian violet instead of red with eosin or rubin.

CASE VI. *Actinomycosis of the Neck*.—(Unpublished). Under the care of Mr. R. C. Chicken, General Hospital, Nottingham, and of Dr. Simpson, of Epperstone. The patient was a young farm labourer of Epperstone, Notts, a village in the Trent Valley. He was twice in hospital between May and October, 1893. From information kindly supplied by Dr. Simpson, it appears that symptoms began in August, 1892, when there was sore throat and enlargement of the right tonsil. Then an abscess slowly formed in the neck, and was opened above the right clavicle. When in hospital it was found that the cervical vertebrae and prevertebral muscles were affected by the disease, which progressed in spite of scraping. Iodide of potassium was also given for a long time. The patient returned home and died in November, 1896. There is no definite record of eating ears of corn, but the patient's occupation would make such an occurrence likely.

CASE VII. *Perityphlitis*.—(Unpublished.) Under the care of Dr. Sharp, of Derby, and Dr. Littlewood, of Nottingham.—The patient was a young man, employed when his illness began as an assistant in a hardware shop in Nottingham. For the following details I am indebted to Dr. Sharp. Symptoms commenced in February, 1893, when he was supposed to have had an attack of typhlitis. A second similar attack occurred in April. Dr. Sharp first saw him in September, when there was a swelling in the right iliac fossa and tenderness behind in the lumbar region. At the operation the spherules of actinomycetes escaped in large numbers. The sinuses were freely scraped, and iodide of potassium was given. Death occurred in a year from the onset of the symptoms. The mode of infection is unknown. The resemblance of this case in its early stages to ordinary relapsing appendicitis is noteworthy.

Several cases of perityphlitic inflammation due to actinomycetes have been met with on the Continent. One such is recorded as cured by incision and drainage by Kern.¹ It is obvious that early operation is desirable in these cases.

Reviewing the seven cases, we may note that in four (Cases I, III, V, VI) the mouth was probably the seat of invasion, and

¹ *Correspondenz-Blatt für Schweizer Aerzte*, September 15th, 1891.

that in all the digestive tract was affected. In three (Cases III, IV, V) there was a definite history of the eating of ears of barley or corn, and in two others (I, VI) this was probable, I having helped at harvest, and VI being a farm labourer. Of Case VII, in which symptoms of typhlitis began in February, nothing can be said as to the mode of infection; but of the six others it should be noted that in five the symptoms commenced in the late summer or autumn months—that is, soon after the harvest; while the remaining patient (Case V) had eaten barley and wheat at various times of the year. The suspicion which other observers have thrown upon uncooked cereals as a source of infection in actinomycosis is therefore to some extent supported by these cases.

In conclusion, I must thank my colleagues, Drs. M. O. Taylor and Chicken, for permission to make use of their cases, and to Drs. Littlewood, Sharp, and Simpson for valuable information.

APPENDIX.

The following case, seen since the above paper was written, is of interest especially in regard to the mode of infection.

Mr. B. was brought to me on November 27th, 1895, by Dr. Littlewood, with a swelling in his neck. The following was the history of the case:

Towards the end of September, 1895, while out shooting in Ross-shire, the patient ate some grains of oats, and became aware that one stuck in the right tonsil. Efforts were made to dislodge it, but a few days later the tonsil swelled, and in the course of a week suppurated and discharged matter. Under treatment the inflammation subsided, and for a fortnight the patient felt no discomfort. During the last week of October, however, he noticed a swelling just under the angle of the jaw on the right side. The lump, which was but slightly painful, slowly spread down the neck, so that at the date of his visit to me it appeared to reach the thyroid cartilage. The original swelling under the jaw had, however, by this time diminished in size, and I could feel here but a kind of thickened cord. This seemed to pass upwards inside the jaw, and downwards was continuous with an irregularly oval mass about 2 inches in its long diameter. This mass was firm and slightly brawny. It did not implicate the skin, which was of normal colour and was not very tender. Its lower end reached to the position of the top of the right lobe of the thyroid gland, but this organ appeared normal. The pharynx, larynx, mouth, and teeth were normal.

From the history of the infection, the mode of growth, and the characters of the swelling I gave the opinion that the case was probably one of actinomycosis. We arranged to immediately give and push iodide of potassium, but, in view of the contiguity of important structures to the growth, not to postpone operation for more than a week or two if the drug failed to produce marked benefit. Mr. A. R. Anderson, who saw the case two days later, entirely agreed with the diagnosis and proposals for treatment. Dr. Felix Semon and Mr. Butlin also thought the diagnosis not improbable. The patient took iodide of potassium for a fortnight, reaching a dose of 100 grains per diem, but no distinct improvement was observed. The skin became reddened, infiltrated, and brawny, and the growth spread somewhat towards the front of the thyroid cartilage, at which spot it became softer. No rise of temperature was observed. Accordingly, on December 12th Mr. Anderson operated, making a long incision down the side of the neck and a transverse cut across the front of the thyroid cartilage. The latter at once opened an abscess about the size of a walnut, and in the pus which escaped numerous spherules of actinomycetes were found. The rest of the swelling consisted of granulation tissue, which was freely scraped away, some portions of sternomastoid muscle being removed and the skin scraped quite thin. The wound was washed with perchloride of mercury lotion (1 in 2,000), dusted with iodoform, and stitched up, with a drainage tube at its lower end. The patient made an uneventful recovery from the operation; there was but little discharge, and the tube was removed on the second day. With the exception of a temporary oedema of the edges of the transverse incision about a fortnight after the operation, there was never any appearance of a recurrence, and this was a false alarm. He took iodide of potassium, in daily doses of $\frac{1}{2}$ drachm, for a month after the operation, and is now perfectly well.

The case indicates the advisability of early surgical interference in this disease, as some extension certainly took place during the fortnight of medical treatment. Rydygier² has recently reported one case nearly cured by the injection of pot. iodide into the swelling, and another completely cured after taking 150 grammes of iodide; but, when operation is feasible and important structures are endangered, it is clearly right to use the drug only as a supplementary therapeutic agent.

THE PROGRESS AND TREATMENT OF A CASE OF ACTINOMYCOSIS COMMENCING IN THE VERMIFORM APPENDIX.

By D. FAIRWEATHER, M.A., M.D. EDIN.,
Wood Green.

As is usual in actinomycosis, the disease in this instance existed for a long time before it could be demonstrated.

During 1892, at intervals of about three months, the patient, a strong

man, had three attacks of twisting pain over the abdomen. The pain became localised in the right iliac fossa. Each seizure was more definite than its predecessor. The breath was very offensive, and the patient became more irritable, thinner, and apathetic. There was no abnormality in the urine.

In February, 1894, there was a recurrence of the symptoms, and now there was no doubt that he was suffering from appendicitis. Three colleagues who examined him came to the same conclusion. The disease lasted about three weeks, and then the patient apparently recovered.

In May, 1894, he had another attack. A swelling on the right side appeared, and reached from the anterior extremity of the eleventh rib to the middle of Poupart's ligament. Symptoms pointed to matter formation, and on several occasions quantities of pus and gelatinous material were discharged through the bowel. A boggy swelling next showed itself in the right lumbar region. Mr. Godlee opened this, and a large amount of material, similar to what had passed *per rectum*, was evacuated. In the discharge actinomycotic granules were discovered. The wound, which was very septic, was irrigated by iodine solution. There was no more discharge *per rectum* after this time. Five-grain doses of potassium iodide were given three times daily, but with no appreciable effect.

On August 1st the swelling in front, now fluctuating, was opened by Mr. Godlee. The incision was a little above and towards the outer third of Poupart's ligament. Very severe hæmorrhage (a likely contingency in these operations) followed the attempt to establish communication between the anterior and posterior abscess cavities. The wound was packed with strips of boracic lint.

After consultation with Mr. Godlee and Sir William MacCormac, 20-grain doses of potassium iodide were ordered three times a day, and the first dose was given on August 5th. Profuse serous discharge quickly followed, and the granules gradually altered in size, consistence, and characteristics. The medicine was continued till August 21st, when it was stopped by reason of gastro-intestinal disturbance. It was resumed on September 1st, and given till the 19th, when it had again to be discontinued.

Mr. J. J. Hemming (*locum tenens*), finding the patient intolerant of iodide of potassium, gave iodide of sodium in 12 to 15-grain doses three times a day, and he remarked similar changes in the discharge and granules. The patient's general condition distinctly improved, and the inflammatory effusion and discharge diminished. The discharge had acquired a peculiar mouldy smell. However, he changed again for the worse, and could not retain the sodium iodide.

On November 18th, and for seven subsequent days, I injected a 2 per cent. solution of iodide of potassium. It cleaned the burrows effectively, but I did not note any diminution in the deposit.

On December 15th, whilst the patient was under the influence of chloral, sp. vini rect., and water (1 in 3) was used as a douche. The solution trickled through all the openings. The quantity of pus increased, and in four or five days masses of deposit, faecal in odour, came away. The injections were continued till January 10th, when, owing to the patient's weak condition, the irrigation was stopped. He became extremely emaciated and weak, and died quietly on February 23rd, 1895. For a few days before death there was scarcely any discharge.

The "sectio" was made by Dr. James Galloway. Both thighs were flexed; the right more firmly fixed. There was no fluid in the peritoneal cavity; the burrowing and matter were entirely extraperitoneal. The bowels were extremely attenuated. The opening of the vermiform appendix was closed by old inflammatory material. There was a cyst in the appendix containing mucus, and about the size of a cherry. Beyond this the appendix was obliterated by inflammatory material. There was no caseous or granular matter. Behind the cæcum was a mass of adhesions, which included the appendix. A large inflammatory area extended beneath the peritoneum, along the right borders of the lumbar vertebrae (without affecting the bones or periosteum) up to the diaphragm. The area of disease was free from pus and caseous matter. Only the walls of what had been an abscess remained. There was nothing to demonstrate actinomycosis. Several sinuses led from the abscess cavity to the skin. The right psoas muscle was the seat of an abscess which had opened in Scarpa's triangle. There was no disease or secondary deposit in the lungs, liver, or other organs. A slight old pleuritic adhesion existed at the middle of the posterior margin of the lower lobe of the right lung. In the "sectio" we saw no remains of corn or other cereal, but it is probable that the fungus reached its first point of attack by some such vehicle. The fact that the patient had a constant habit of chewing these substances whenever opportunity offered, and the numerous cases of Bostroem and Jensen's observations point to this conclusion; and, except in the appendix, there was an absence of lesion in any other organ, abdominal or thoracic. The patient's occupation did not bring him into contact with horses or cattle.

Thomassen¹ cured 80 per cent. of cattle with 75-grain doses of potassium iodide twice a day, the tumours being cross cut and tincture of iodine applied. He afterwards gave up the tincture of iodine, and achieved marvellous results with the potassium iodide alone. Thomassen² also mentions four successful cases in man, the doses varying from 15 to 40 grains per diem. Ransom's patient recovered under 60 grains per diem. Buzzi and Valerio³ gave 30 grains daily for three months with successful result. Netter⁴ gave 60 grains per diem with recovery.

The changes in the discharge and granules in this case were:

1. Rapid thinning and profusion of discharge; most distinct during the first two periods, when the more diffusible potassium iodide was given.

¹ Bureau Animal Industry, New York, 1893, p. 210.

² Edinburgh Royal Infirmary Reports, vol. ii, K. C. F. Leith.

³ Reform. Med., May, 1893.

⁴ Tribune Méd., 1893, No. 46.

² Wiener klin. Woch., 1895, No. 37; Ref. in Bakt. Centr. bl., 1895, No. 17.