months, soon followed by metastatic deposits in the liver, death ensuing in 28 months after the operation.

In the villous carcinoma the prognosis is more hopeful. In my series of 21 cases, 5 were too extensive for any operation owing to the extent of the extravascular infiltration, but in 6 I performed a palliative operation to remove the exuberant masses of growth in the bladder either for hæmorrhage or for obstruction. In each of these recurrence took place rapidly. In the remaining 10 cases I resected the growths widely in the absence of any apparent extravascular spread of the disease, and in 4 was obliged to resect a part of the terminal portion of the ureter. Of these 4, 2 are alive and well after 4 years and 2½ years, but the two others recurred after 1 year and 1½ years with glandular deposits. In the remaining six cases, 2 are alive and well, 1 after 4 years and 1 after 1 year; 2 rapidly recurred in the bladder, and 2 cannot be traced. In one of the recurrent cases of this last group I operated a second time, removing a large piece of bladder wall, but recurrence again occurred in a year, and the patient refuses further operative treatment.

In cases of carcinoma of the bladder in which radical treatment cannot be carried out, it may be necessary to provide treatment for the more urgent symptoms. If hæmaturia is severe similar treatment to that recommended in villous papilloma should be tried—namely, complete rest under morphia, with ergot and calcium lactate in large doses; irrigation of the bladder with hot silver nitrate solution 1:5000 at 115° F., or with adrenalin 1:2000. If there be clotting in the bladder an attempt should be made to extract it by an evacuating cannula and bag, and should the hæmorrhage not yield to these measures a suprapubic cystotomy should be done, any fungating growth removed, and the base treated with the cautery.

Pain and increased frequency of micturition may become very distressing in vesical carcinoma, and often in part are caused by accompanying cystitis. Sandalwood oil and urinary disinfectants should be given, and the bladder irrigated with hydrogen peroxide (one volume) or weak nitrate of silver solution; suppositories of belladonna and morphia or a small enema containing tinct. opii ℥xx. may relieve it. In several cases under my care I have opened the bladder above the pubes, removed any fungating growth, and provided a permanent suprapubic fistula with great relief to the unfortunate patient.

Finally, I have tried the effect of placing a tube containing 50 mgrm. of radium into the bladder for periods of from 12 to 24 hours, but I cannot say that I have found any relief from pain from its use nor any diminution in the size of the growth. The bladder is often so intolerant that the presence of the tube causes pain, but I think further trial should be given to radium in these cases so that experience may be gained in the proper dosage, &c. We must not expect radium to do all the wonders in cancer that the lay press would have us believe, especially where the malignant process has spread beyond the bounds of its original focus, but in a few cases of carcinoma in other regions I have undoubtedly seen good results from it, and so shall persevere with it when the opportunity arises and when radical operative measures are contraindicated.

Wimpole-street, W.

DEATH FROM HYPERACUTE STREPTOCOCCAL INFECTION (STREPTICÆMIA)

FOLLOWING RADICAL REMOVAL OF CERVICAL TUBERCULOUS GLANDS WITH SINUSES.

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THE two cases which I report below are of sufficient interest to have attention drawn to them. They present a possibility of which I had been unaware—namely, death within a few hours of radical removal of tuberculous glands. Moreover, I have been unable to find any reference to such an occurrence in the literature, and though I have since heard of such cases in conversation they were regarded as very mysterious and the true import of them had not been appreciated. I regret that only the second case was adequately inquired into after the warning given by the first case, but the clinical details corresponded so closely in both that one cannot but believe that they were both victims of the same disaster.

CASE 1.—The patient was a male aged 1 year and 10 months. He was a very big boy for his age, fat and chubby, but a little rickety. There was a family history of consumption on the father's side. Six and a half weeks before admission to the Victoria Hospital for Children, Chelsea, lumps appeared on the left side of his neck in the occipital region. These went down of their own accord. One week previously a lump had appeared in the upper cervical region of the same side. This lump became red and inflamed owing, his mother said, to a knock received in bed. On admission there was a red fluctuating gland adherent to the skin in the left upper cervical region. There were one or two large glands deep to it. On Oct. 21st, 1912, the gland was incised, but was found to contain nothing but soft, grey, tuberculous-looking material without caseation. It was scraped out and this gland was found to lead into a deep one, which was similarly treated. The wound refused to heal, and protuberant pale granulations sprouted from it. After nearly a month of trying to accelerate healing a radical operation was decided upon. This I performed on Nov. 18th. The old scar was excised, and a complete removal of the enlarged glands on the left side of the neck was carried out. They were very adherent to the sterno-mastoid (which had to be divided) and also to the carotid sheath. A mass of glands extending from the clavicle to the angle of the jaw was removed. The wound was closed with a continuous suture and a drain inserted through a separate puncture hole in the skin flap. All went well until 1 A.M. the following day. The child had seemed very well considering the severity of the operation. His pulse, however, suddenly rose to 160 and became full and bounding. His temperature rose from 98° to 102° F., and the face became flushed and blue. The patient was now unconscious. There was no hæmorrhage from the wound, which was opened up and washed out. Saline was administered and stimulants and heat supplied, but he died two hours later—12 hours after operation. He vomited only once, shortly before death. The urine was free from acetone or diacetic acid.

CASE 2.—The patient was a female aged 3 years and 8 months. There was a family history of pulmonary phthisis on the father's side. A lump appeared on the right side of the neck 18 months previously when the child was in South America. This swelling was allowed to burst; it discharged pus for some time after. There had been a small sinus over the gland ever since with a slight discharge which during the last three weeks had been worse. On admission the patient was found to have a typical tuberculous sinus leading down to a deep gland, with which was associated considerable peri-adenitis. On Jan. 16th, 1913, I performed a radical operation for removal of the glands on

the right side of the neck. A long incision was carried along the anterior border of the sterno-mastoid in the usual manner, commencing below and behind the mastoid above and ending immediately above the clavicle. The incision encircled the sinus in such a manner that this was removed *en bloc* with the glands. Care was taken to remove the chain of small glands along the outer aspect of the jugular vein. The wound was closed and a drain inserted as in Case 1. The child seemed very well on the evening of the operation, but about 4 o'clock the next morning she woke up with a scream and had a rigor. Her pulse was found to be 160 and her temperature 106° F. She was unconscious and lay muttering to herself. She was a little restless at first, with twitchings of her limbs. She presented signs of an acute toxæmia with her high temperature, rapid bounding pulse, flushed rather cyanosed face, and unconsciousness. There was no acetone or diacetic acid in the urine, and no vomiting. She was kept warm by means of a 16-candle power lamp in the bed in the manner employed as a routine at the Victoria Hospital. Strychnine and digitalin were administered as the heart flagged, and finally an intravenous injection of sodium bicarbonate was given in deference to the opinion of one who believed the condition to be an acidosis. The patient died at 12 noon—20 hours after the operation.

The cause of death.—Unfortunately no post-mortem examination was permitted in either case, but in the second I obtained a specimen of the heart's blood by puncture soon after death. A swab was also taken from the wound, and these two were sent to the Lister Institute for bacteriological examination. They reported the presence in the blood and on the swab of "a short-chained streptococcus, presumably the same family in both instances." There can be little doubt that the cause of death in this second case was a hyperacute invasion by streptococci, and I am equally convinced, from the similarity of the clinical pictures, that this was the cause of death in the first case also. There were none of the classical signs—vomiting, extreme restlessness, and acetonuria—of a delayed chloroform poisoning, though this drug was used as the anæsthetic in both cases. The suddenness of the onset rather favoured embolism, and in the absence of a post-mortem examination this cannot be absolutely negated. However, the pyrexia, the full bounding pulse, and the flushed, rather cyanosed, face were indicative of a severe blood infection rather than a massive infarct. Further, the wounds were thoroughly opened up during life, and there was seen to be no sign of thrombosis in the jugular vein.

Origin of the infection.—It is extremely improbable that the streptococcus was extraneously carried into the wound through imperfect operative technique. I think that this source can be ruled out at the outset. It is almost certain, however, that the operation lighted up a smouldering infection. In this connexion it will be remembered that sinuses were present in both these cases. In the first case this followed aseptic incision and curettage and had been antiseptically treated in the wards till the time of the second operation. Nevertheless there had been an inflammation in the gland, non-pyogenic, and therefore very likely a mild or thwarted streptococcus infection. The sinus in Case 2 had been present for some 18 months, and had had household treatment only for some time previously. It is highly probable that organisms were already lurking in the sinus, and probably in the gland tissue and lymphatics also. The manipulation necessary for the removal of the glands would very likely cause a spilling of infective material into what is really a very large open wound. Absorption would very readily take place

directly into the blood or *via* the deep lymphatics and thoracic duct (Thiele¹).

Dr. A. Stanley Griffith, of the Field Laboratories, Cambridge, to whom the glands of Case 2 were submitted as material for his research upon the varieties of tubercle bacilli found in cervical glands, did not find any streptococci in the glands themselves. But as he said in a letter: "I am afraid my investigation, confined as it is to the purely tuberculous tissue, will not be of much help to you in deciding whether the streptococcus infection started before or after the operation." However, his examination of the glands from this case is so interesting that I cannot do better than quote his notes at length.

The material consisted of a group of glands and several separate ones. The group was attached to a diamond-shaped piece of skin, in the centre of which was a sinus. The latter was found to end in dense fibrous tissue which was apparently the remains of a tuberculous gland, the contents of which had been evacuated. Below this fibrous patch were two enlarged glands which contained dry caseo-calcareous masses which readily shelled out from a fibrous capsule; a third small gland contained a caseo-calcareous tubercle. The other (separate) glands appeared slightly enlarged, but were not obviously tuberculous. An emulsion was made of the caseo-calcareous substance and inoculated into guinea-pigs. Cultures were also sown with the caseo-calcareous substance, but these have so far remained sterile; no streptococci have grown. I found no organisms of any sort in a smear preparation of the emulsion. Two guinea-pigs were inoculated with an emulsion from two glands and neither of them developed tuberculosis. All the cultures sown with the emulsion remained sterile. There were therefore no streptococci or living tubercle bacilli in the material investigated.

Hence we see that the caseous material at least was found sterile. Whether the sinus would have been found sterile or not is another matter. And the same is true of the organised material removed—the capsules of the glands, the fibrous tissue, and lymphatics. In these cases with sinuses there is probably a fairly rich bacterial flora in the sinus walls and in the numberless lymphatics which are necessarily cut across at operation.

Other cases.—In looking through the records of the Victoria Hospital, Chelsea, for the past 25 years I found but four deaths in 533 operations on tuberculous glands, a mortality of 0.75 per cent. The four deaths were these:—

1. Died eight days after from tuberculous meningitis.
2. Tuberculous abscess with sinus; curettage; death from erysipelas.
3. The notes state that after liberating pus "breaking-down gland tissue extending in all directions was with difficulty and violence scraped away, a large ragged cavity finally remaining." The child died the following evening with a temperature of 107.8° F.
4. At operation hæmorrhage was severe; wound opened and packed after four dressings. Frequent coffee-ground vomiting; pain in abdomen. Diacetic acid in the urine. Temperature rose to 105.2°. Child died just over 24 hours after operation (typical delayed chloroform poisoning; excluded in my cases).

These four cases represent practically the only four possibilities of death following operation on cervical glands. Presumably Cases 2 and 3 are both deaths from acute streptococcal infection, but of a grosser and more obvious nature than the two cases I have reported above. The medical profession has been wont to regard the operation of removal of tuberculous cervical glands as safe if tedious.

Prophylaxis.—The lesson to be learned from the

¹ F. H. Thiele: Channels of Spread of Bacterial Infection, Royal Society of Medicine, 1914 (Thiele and Embleton).

above rather bitter experiences is that careful attention must be paid to sinuses for a few days before operation. They should be well swabbed out daily with iodine or carbolic alcohol. It would be well in most cases to obtain a culture from the sinus before determining the date of operation. As for treatment, once the bacteriæmia has set in probably no remedial measures will be of avail. The wounds were opened and flushed out with saline in both cases without success. In these hyperacute infections little can be expected from anything but intravenous anti-serum, and little enough from that. The body weight of these victims is so small that a comparatively small dose of streptococci will be lethal.

Finally, a note on the operation itself. It is now customary to remove all the glands of the affected side of the neck in a manner only slightly less thorough than if they were malignant. There can be no doubt but that this is the ideal method of treatment (Müller²), as by this means not only the obviously affected glands but also those which are in the incipient stage are thoroughly removed. Close attention should be paid to the small glands on the outer side of the carotid sheath, as these are very liable to become affected and spread the trouble into the posterior triangle. Indeed, Judd³ plans his incision entirely in the posterior triangle so as to remove the "Fettpolster" of Merkel, and goes on to strip the deep cervical chain from behind.

Summary and conclusion.—1. The radical removal of tuberculous glands in the neck, whilst the only rational procedure, is not unfraught with danger. 2. This is especially the case in the presence of a sinus. 3. Two cases operated upon by me died from a fulminating streptococcal infection, one 12 hours, the other 20 hours after operation. 4. The exact source of infection was not discovered, but was probably the walls of the sinuses present. 5. Prophylactic treatment should be carried out for a few days before operation—the sinuses should be well swabbed out with iodine or similar antiseptic. 6. The wound should be well washed out with saline before it is closed and drainage employed, preferably through a separate stab wound in the skin flap. 7. In children at least probably no treatment will avail when once the bacteriæmia is established.

I desire to express my indebtedness to Mr. Joseph Cunning, whose house surgeon at Tite-street I was, and who very kindly allowed me to operate upon and report these two cases. I am also indebted to Dr. Griffith for the excellent report he so courteously furnished me with.

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² G. P. Müller: Treatment of Tuberculous Cervical Lymphadenitis, *Annals of Surgery*, 1913.

³ Starr Judd: Collected papers of Mayo Clinic, 1910-11.

CAMBRIDGE RESEARCH HOSPITAL.—The studies which are being carried on at the Cambridge Research Hospital in connexion with rheumatoid arthritis and allied diseases have reached a stage at which it is essential that those working at the hospital should be provided with a properly equipped operating theatre, in order that more advanced research may be undertaken into the cause and treatment of these diseases. As there is no room suitable in the present building it will be necessary to build, and Mr. Otto Beit has generously promised the sum of £700 for the erection of this building, and has further promised the sum of £100 per annum for the next ten years towards the general maintenance of the hospital.

CONGENITAL ICTERUS.¹

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IN his "Lectures on Diseases of Children" Dr. R. Hutchison aptly states that "so soon as the child is born it meets with various adverse influences which may render it the subject of disease before it has hardly begun to live." Had he said, "So soon as the seed is sown, or earlier than this, adverse influences are frequently active in harm for the future generation," he would have been equally correct and his words would have carried a greater significance. In the subject under consideration—congenital icterus—post-natal influences are of small moment, for the factors which are working to produce the abnormalities observed in such cases exert their principal energy during intra-uterine life, and they may even be hereditary.

Let me first very briefly compare the various forms of icterus neonatorum so that there will be no misconception as to the particular form to which I wish to draw the attention of the section. The simple jaundice so often met with occurring during the first week of life is really better called pseudo-jaundice. It is generally believed by the best observers to be due to inability of the liver to discharge sufficiently rapidly *via* the bile the products of red-cell disintegration. This red-cell destruction is, as you are aware, a normal process in the new-born, the child born with $5\frac{1}{2}$ or 6 million red corpuscles per c.mm. and 110 per cent. of hæmoglobin having normally at about the end of the second week but the usual 5 million cells of the adult. It is believed that the débris so created renders the bile unduly viscid; that the bile capillaries become over-filled, and reabsorption follows stagnation of bile with consequent jaundice. In this form the conjunctiva is not injected, and the stools are not clay coloured. The trouble is transient and always benign. The blood origin of the affection has set some observers carefully comparing the effect upon the infant, as regards jaundice, of early and late ligation of the umbilical cord, with the result that a larger percentage of infants were found jaundiced when the cord was ligated late, thereby permitting more placental blood to reach the child.

The form of jaundice in which the conjunctiva is deeply injected, the stools colourless, the urine loaded with bile-pigment, and the child unduly drowsy, is said by some to be due to similar causes as the pseudo form, but in more marked degree; by others to be due to patency of the ductus venosus with lowered tension in the portal circulation and increased tension in the bile capillaries: but whatever its origin it seldom progresses to convulsions, coma, and death.

I need say little about the septic form of jaundice due to cord infection—its pathology is well known and its prevention simple. Syphilitic disease is usually recognisable by other signs and symptoms, and if liver degeneration is not too far advanced appropriate treatment is effective.

There remain, then, two forms of icterus—excluding Winckel's disease and Buhl's disease—to be discussed: namely, congenital abnormalities of the bile passages and familial jaundice. In the former there may be a defective development of the

¹ A paper read before the Obstetrical Section of the Royal Academy of Medicine in Ireland on April 3rd, 1914.