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THE

MEDICAL AND SCIENTIFIC ARCHIVES

OF THE

ADELAIDE HOSPITAL.

No. 2.

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The first issue of these Archives appeared last year (1921). In an editorial introduction, we indicated that the object held in view was to rescue from oblivion much valuable information that otherwise would be lost. The publication of details of important and interesting cases, with comments thereon when necessary, would, we felt, help in the work of the hospital by crystallising out, in permanent record, their essential points so that the information to be obtained from their study might be of assistance in dealing with similar cases in the future. We hoped, also, that others would find material of interest and value in the pages of the Archives. To some extent our first issue did, we believe, fulfil these hopes. In this second issue we have followed the same plan. As a full record of the work of each of these years, neither series can claim to be in any way complete. Many cases that should have ben reported have had to be passed over, and this state of things must continue until the reorganisation of the Records and the appointment of Registrars has been achieved. Even the recording of the few cases contained in this series has necessitated a very large expenditure of editorial time.

We have continued the record of all cases of hydatid disease, believing that this complaint, with more perfect hygienic control, will decrease materially in the near future, and that meanwhile all information about cases should be permanently recorded.

An interesting feature in this issue is the inclusion of the full details of a number of cases of the typhus-like disease discovered in this State by Dr. Hone. A further general account of the disease, based on this second series of cases, will appear shortly in the Medical Journal of Australia.

The Editorial Committee has decided to include details of all cases suffering from cerebral tumors met with during the year, to ensure permanent records of these.

I.—HYDATID DISEASE.

Only seven cases were dealt with during the year. Of these, three reached the *post-mortem* table, but in one of the three death did not occur until February, 1923. Hence, out of the 162 autopsies performed during 1922, in only two cases were hydatid cysts found. Thus, during the years 1920, 1921, and 1922, hydatid cysts have been found *post-mortem* in eight out of 512 cases. In one of the two cases in 1922, the hydatid cysts were obsolete and degenerated, and had given rise, at any rate recently, to no symptoms. In the other case, over a period of 30 years the unfortunate patient had had 17 operations for recurring hydatid cysts, succumbing in the end to an unconnected malignant growth of the bladder. The patient with a cerebral hydatid survived operation for a considerable time, dying in 1923 from meningitis and abscess formation.

(1) RECURRENT HYDATID DISEASE OF THIRTY YEARS' DURATION; SEVENTEEN OPERATIONS; DEATH FROM CARICINOMA OF THE BLADDER.

(*Under the care of Dr. Cudmore, Honorary Surgeon. Notes by Dr. C. Turner, Medical Superintendent.*)

C. L., male, *æt.* 64, a carpenter by trade, residing at Norwood, South Australia, and born in Victoria, had been suffering from hydatid disease for 30 years. At 34 years of age he had a hydatid in the right lung, which he coughed up. Six years later he had one in the left lung, which was treated by operation. He was well after the operation for 16 years, and was then operated on for a ruptured hydatid of the liver. Subsequently he was operated on 15 times for hydatid disease. He had had altogether about 30 incisions, of which the greater number were abdominal, nine in the midline, four on the right side of the abdomen, and three on the left. There was also an incision over the left chest laterally, and an oblique incision in the right loin. He had been in hospital many times, and operations revealed hydatid disease of the lungs, liver, peritoneal cavity, and right retro-peritoneal tissues. He was finally admitted to the hospital in April, 1922, with the superadded condition of carcinoma of the bladder, and he died in an extremely anæmic and cachectic condition on June 2nd, 1922. The following is a resumé of his last five visits to the hospital.

On April 22nd, 1920, he was admitted, complaining of pain in the right shoulder, diarrhœa with blood, and abdominal pain. The pain was situated about the umbilicus, and was aching in character and associated with backache. There was no abnormality of micturition. His appetite was fair. He was losing weight, but not to an extreme degree. His temperature was normal, the respirations were not abnormally frequent, and his pulse was 80 per minute. His chest revealed an increase in the liver area, which extended, on the right side in the mid-clavicular line, from the fifth costal interspace to a line 1in. above the umbilicus. There was diminution of function at the base of the right lung from pressure by the liver, but no evidence of pulmonary involvement with echinococcus. Through the thin cicatricial abdominal wall above the umbilicus there was palpable a rounded, circular mass. This latter felt firm and elastic, but was softer and semi-fluctuant at its middle. There was tenderness on palpation of the epigastrium. The hydatid

thrill was not elicited. The lower part of the abdomen was free from resistance, tenderness, or mass. The urine was free from albumin and sugar. On April 23rd an incision was made in the midline above the umbilicus and through the old scar tissue. There was only a thin layer of skin and adherent cicatricial fascia over the liver in this region. The adhesions were separated and the abdominal cavity opened. From the upper peritoneal cavity, in the region of the mass, many hydatid cysts were evacuated. The cysts varied in size. Some contained daughter cysts and others were filled with clear fluid. The wound was closed, and a drainage tube inserted to the right of the midline. Subsequently, on May 4th, when the sutures were removed, the wound broke down and discharged about a pint of pus. The sinus finally healed, and he was discharged on May 20th. The course was a febrile one, there being usually an evening rise to 99° F., and a morning fall to normal.

He was readmitted five months later (October 6th, 1921). The last incision had healed. He complained that for 10 weeks he had experienced a burning pain when he micturated, and three days after the onset of the pain he had passed blood in his urine. He later had pain in the right loin. The pain commenced suddenly, was sharp in character, and passed into his back. Three days after the onset of the pain in the loin he was awakened at night, and coughed up a cupful of blood. The pain in the loin was relieved, and had not been present since. The hæmaturia had, however, persisted with remissions. There were no "skins" in the blood he coughed up, nor in his urine. He complained of some flatulence after taking food; his bowels were regular, and he had gained 8lbs. in weight since his previous operation. There was no cough at the time of admission. His temperature was normal, the respirations 20 per minute, and the pulse 97 per minute. His general condition was very good. Examination of the chest revealed no gross pathological change. The liver dullness extended from the fifth interspace to a line 2in. below the costal margin. In the right loin could be palpated a large tense mass. The urine contained a faint cloud of albumin after boiling and much blood. No scolices were found microscopically. On October 13th, under ether anæsthesia, an oblique muscle-splitting incision was made in the right loin. A large hydatid cyst presented and was shelled out. The cyst was situated in the retroperitoneal tissue. Drainage was established. He made an uninterrupted recovery, and was discharged on October 21st, 1921. He still, however, had some blood in the urine. There was some post-operative pyrexia for five days.

He was readmitted on November 12th, with pain and tenderness in the scar of the last incision. The wound was re-opened with a probe, and 1oz. of pus evacuated. The wound healed again in three days, and he was discharged.

On January 4th, 1922, he again came into the hospital. He complained of great shortness of breath, with free sputum, which had been bloodstained during the previous few days. He had also coughed up some hydatid cysts. He was still passing blood in his urine intermittently; sometimes small clots were passed, and frequently the urine was highly colored with blood. He was losing weight and strength. When examined he was moderately collapsed, pale, and slightly cyanosed. The circulatory condition was not promising from the surgical viewpoint. A mass presented below the right costal margin, and there was some free fluid in the peritoneum. Two days after

admission his condition was worse, and it was decided to operate. A hydatid cyst of the liver was opened by an incision tity of hydatid fluid and some ascitic fluid removed. The cavity was drained for two days. The incision subsequently healed, and he was discharged on January 22nd, 1922, in a weak and anæmic state, although he was able to get about. He was still passing blood, at intervals, in his urine.

He was readmitted finally on April 20th, 1922. He complained of extreme weakness, dyspnœa, palpitation, and hæmaturia. Micturition was sometimes very painful when he passed clots. He was exceedingly pale. The liver was enlarged, and could be felt 3in. below the costal margin. He had a large hernia containing bowel in the right loin at the site of a previous operation. The urine contained many clots and fluid blood, but no hydatid elements. On April 24th he was anæsthetised, and his right loin re-incised. A fairly large hydatid cyst was located above the right kidney. The cyst was opened, and hydatid fluid and daughter cysts evacuated. A drainage tube was inserted, and the wound closed. On May 19th, suprapubic cystotomy was performed. An extensive infiltrating mass was found invading the base of the bladder. A tube was sewn into the bladder. An incision was then made in the right hypochondrium, and a single hydatid cyst was opened and drained. His general condition became rapidly worse, and his urine foul from decomposition. He died on June 2nd, 1922.

At the autopsy (No. 62/22) numerous operation scars were noted in the abdominal and right lower thoracic regions. There were two open suppurating wounds, one in the right subcostal region, the other in the suprapubic area. The lungs were almost universally adherent to the parietal pleura. The right lower lobe was largely replaced by scar tissue, and contained a somewhat shrunken echinococcus cyst about the size of a fist. There were no signs of tuberculosis in the lungs, but both organs were slightly fibrotic. The abdomen contained a right subphrenic and subhepatic collection of pus communicating with the recent wound. There were adhesions almost everywhere binding the intestines together and to the other viscera. Moderate-sized hydatid cysts were scattered about widely, the largest being about 4in. x 3in. x 3in. A moderate-sized cyst occupied the upper pole of the right kidney, and was only separated by a thin membrane from the pelvis. Its contents were septic. The left kidney was in a condition of pyonephrosis. The right, in addition to containing the suppurating hydatid, showed cloudy swelling of its parenchyma. The liver had a number of scarred cysts in relationship with its under surface. The spleen was firm and dark-red in color, and contained an hydatid cyst in its upper part about 2½in. in diameter. The urinary bladder showed a malignant ulcer at its base about 1½in. in diameter, with heaped up, irregular, indurated edges. Microscopically extensive carcinomatous invasion of the bladder wall was detected.

(2) HYDATID OF THE LIVER WITH POSITIVE CUTANEOUS AND COMPLEMENT FIXATION TESTS.

(*Under the Care of Dr. Hone, Honorary Physician, and Dr. Smeaton, Honorary Surgeon. Reported by Dr. Barlow, Honorary Clinical Pathologist.*)

G. P., a male, *æt.* 58, was admitted to hospital on August 2nd, 1922, complaining of a sensation of fulness in the stomach,

which was worse after meals. He had only noticed the symptoms about 10 days earlier. On one occasion he had pain of an acute character, which radiated to the right side of the back. Otherwise his health had been good. He had suffered from indigestion 14 years previously, but he had had no serious illnesses. On examination the patient was a thin man, obviously jaundiced. He had pyorrhœa. No abnormal signs were detected in the chest. The liver dulness was not increased upwards, but downwards it extended to 1½in. below the costal margin in the mid-clavicular line. The lower edge could be felt, and was firm and somewhat tender. The prostate felt large, irregular, and somewhat hard. Two days later pleural friction could be heard in the third to fifth intercostal spaces anteriorly.

The Wassermann test gave a negative result. A differential blood count resulted as follows:—Polymorphonuclear cells, 30%; lymphocytes and large mononuclears, 30%; eosinophiles, 40%. The fæces were examined for parasites and ova, but none were found.

On August 17th, 1922, the blood was examined for the hydatid complement fixation test, and a strongly positive reaction was obtained. This was confirmed by the Walter and Eliza Hall Institute, Melbourne. An intradermic test was made with hydatid fluid, and a most definite reaction obtained.

On August 26th an operation was performed, and an hydatid cyst of small dimensions was found in the right lobe of the liver on the medial side of the gall bladder. Its ectocyst was partly calcified, but it contained daughter cysts and numerous brood capsules and scolices.

Comment.—The above case illustrates the value of the cutaneous and complement fixation tests in cases which clinically are doubtful.

(3) HYDATID OF THE LIVER WTH POSITIVE COMPLEMENT FIXATION TEST.

(*Under the care of Dr. Simpson Newland, Honorary Surgeon. Notes by Dr. C. Finlayson.*)

M. S., female, *æt.* 35, married, was admitted to hospital on July 3rd, 1922. She complained of a swelling situated in the upper left quadrant of the abdomen and present for the past 18 months. No pain or tenderness was associated with it. She had suffered for some time with "indigestion," *e.g.*, flatulence after meals, and she could not wear anything tight around the waist. She could not lie on the left side without discomfort. The bowels as a rule were constipated. Micturition and menstruation were normal.

On examination, the patient was a middle-aged woman lying in bed, well nourished, and in no distress. Examination of the heart and lungs yielded nothing of importance. On examination of the abdomen a large tumor was detected filling the upper left quadrant and causing bulging in the left hypochondrium and epigastric region. It moved freely on respiration, was dull on percussion, and firm in consistency. In the mid-axillary line the upper and lower limits of the dulness corresponded with the level of the eighth and twelfth ribs respectively. Posteriorly it extended to within 1½in. of the spine. Anteriorly above it was continuous with the liver dulness, below it extended just beyond the level of the umbilicus, and medially a little to the right of the midline. The tumor

could be moved freely between one hand placed in the loin posteriorly and the other on its anterior margin. The urine was normal. Examination of the blood was as follows:—White count, 12,400 per c.mm.; polymorphonuclear cells, 78.5%; lymphocytes, 14%; large mononuclears, 4%; eosinophiles, 3.5%. The hydatid complement fixation test was positive. X-rays showed a rounded upward bulging of the left diaphragm.

On July 13th, under a general anæsthetic, Mr. Newland made an oblique incision across the costal margin in the upper left margin of the abdomen. The skin and subcutaneous tissues were divided and retracted, and the muscles split by a paracostal incision. The shining cyst membrane presented. This was drawn up by sutures into the wound. The abdominal cavity was packed off, and the cyst evacuated. It was found to be loculated and to contain numerous daughter cysts; 1% formalin was introduced, and the cavity closed. The incision was closed in layers. Recovery was uneventful, and the patient was discharged on July 27th.

(4) RECURRENT HYDATID CYST IN THE SCAR OF AN OPERATION.

(*Under the care of Dr. Cudmore, Honorary Surgeon. Notes by Dr. H. A. McCoy.*)

E. C., a woman, *æt.* 31, was admitted to the Adelaide Hospital complaining of indefinite pain in the right side of an aching character and present for one month. She had been operated on elsewhere 12 months previously for hydatid disease of the liver, the cavity being drained.

On examination, a subcutaneous nodule was felt in the region of the scar of the previous operation. Under ether, an incision was made over this area. Five small hydatid cysts were removed from the scar tissue, varying in size from a cherry to a walnut.

(5) HYDATID CYST OF THE BRAIN.

(*Under the care of Dr. de Crespigny, Honorary Physician, and Dr. Cudmore, Honorary Surgeon. Notes by Dr. W. Clarke.*)

F. C., male, *æt.* 28, a laborer, born in South Australia, was admitted to the Adelaide Hospital under the care of Dr. de Crespigny on August 28th, 1922. The history of his illness is briefly this. He had been quite well till seven years before, when he had a fit. He enlisted, and after two years in the trenches had a second fit, three years after the first. Since that time he had had many fits, the last one being two months before admission. He felt the last fit coming on him, but had previously had no idea when they were coming. His mouth twitched, his head swayed, and he bit the left side of his cheek. In the fits he lost consciousness for a time varying from 2mins. to 10 hours, most often for about half an hour. His friends state that he becomes violent when he is commencing to have a fit, and recovers with a severe headache. In one fit he passed his urine, but has never lost control of the bowels. After the last fit two months ago he noticed a weakness on the left side of the body. He dropped things out of his left hand, and could not "do up" his stud. At the same time his left leg dragged. His headaches are now more severe over the right supraorbital area and at the same time the right eye swells up and waters. On standing up he feels very shaky because of a "swimming"

in the head and pain around the skull as if the top and bottom were not connected. He gets excited very easily. Memory is poor for events previous to a prolonged fit in November, 1921.

Previous History.—He was kicked on the left frontal area by a horse 12 years ago, was unconscious afterwards, and spent two days in bed.

On examination, the patient was a young man, in no apparent distress, temperature 97°, pulse 76 and regular. The pupils were equal, and reacted to light and accommodation. There was no nystagmus and no squint. The tongue on protrusion was pushed to the left side. The left forehead and eyebrow did not move as well as on the right side. The left masseter muscle was weaker than on the right side. On the left frontal region there was the scar of a previous injury. The left hand grasp was weak. He could not touch his nose with his hand or approximate the tips of the index fingers. The knee jerks were present and very active. There was no clonus. The plantar responses were flexor in type. The superficial abdominal reflexes were not obtained. Sensation to and localisation of pin pricks were normal. There was no astereognosis. Judgment of weights was good. Nothing abnormal was detected in the examination of the heart, lungs, or abdomen. The urine was 1025, acid, with no albumin, blood, or sugar. The Wassermann reaction of the blood and of the cerebro-spinal fluid was negative. The cerebro-spinal fluid gave a negative ammonium sulphate test for globulin and contained no cells. A diagnosis of tumor of the right frontal lobe was made.

On September 22nd an area of skull, about 4in. by 2in. in size, was removed from the right temple. The bone was found very thickened, especially in one place. Here the dura mater appeared yellow, was adherent to the brain, and fluctuation could be felt. On incising around the area, a clear cyst was seen. It was opened, and found to be an hydatid cyst containing fluid and many daughter cysts. The walls were yellow and thick. A drainage tube was inserted. After the operation his headaches disappeared, but fluid collected at the bottom of the wound, and had to be aspirated on several occasions. He was discharged from the hospital, and kept well for three weeks, when he had a recurrence of his fits. These continued every few days for six weeks, and his headache returned, in spite of treatment with potassium bromide and chloral, luminal, aspirin, and lumbar puncture. There was a large hernia cerebri over the trephined area.

At the second operation on September 16th, under a general anæsthetic, Dr. Cudmore partly reopened the previous crescentic incision. A superficial abscess cavity was found and evacuated. Beyond this was a small cavity lined by thick yellow membrane. A trocar and cannula was thrust into the tumor (hernia cerebri) and several ounces of bloodstained fluid withdrawn either from a cyst or from beneath the dura mater, it was not known which. The wound was closed except for a gauze drain. A week later the patient had a fit, which commenced in the left arm, and soon became generalised. It was necessary to aspirate the hernia cerebri every few days in order to relieve his headache. He complained frequently of twitchings in the left eyelids and of premonitions of fits. The left side of the face, the arm, and leg were still paralysed. On February 23rd, 1923, the patient became dazed, though not absolutely comatose, and

complained at first of severe frontal headache. On February 24th 40 c.c. of pus were aspirated from the swelling. On February 26th, under chloroform anæsthesia, Dr. Cudmore reopened a portion of the previous incision. A sinus forceps was inserted, and pus evacuated from an abscess cavity. Next day the patient developed signs suggestive of pleurisy and double lobar pneumonia. He died on February 28th, 14 hours after the onset of these signs.

Post-mortem Examination (No. 24/23).—The bone over the right lateral frontal and parietal regions had been removed. Through the hole a large hernia cerebri projected, covered with the adherent and thickened dura mater, and this by the skin flap. The dura mater was adherent to the bone around the orifice. On removal of the brain, the hernial protrusion and adherent dura mater was found to be located on the lateral aspect of the right frontal lobe, extending backwards to the lateral aspect of the front of the parietal lobe. It extended about 4in. from before backwards and laterally from 1½in. from the middle line to the junction of the lateral and under surface of the frontal lobe. On section through the middle of the area a sinus was seen extending into an irregular cavity, which was 1¼in. in lateral extent, ¾in. in vertical extent, and whose upper limit reached within ½in. of the upper surface. This cavity, probably representing the site of the hydatid cyst that had been removed, had bloodstained thick contents, and was surrounded by a rather thick, semi-translucent adventitious capsule. Internal to this, and nearer the surface, was a smaller area occupied by blood clot. This, when traced forwards, was connected with an area of fibrosis, running forwards as a cylindrical strand about ¼in. from the surface of the brain. In the centre of the strand was a core of folded and compressed laminated hydatid membrane with a diameter about that of a slate pencil. There were signs of meningitis in the Sylvian fissure and base of the brain. The lungs showed congestion and some indefinite patches of hypostatic pneumonia.

(6) HYDATID CYST IN THE AXILLA.

(*Under the care of Dr. Smeaton, Honorary Surgeon. Notes by Dr. Clarke.*)

A. H., *æt.* 17, a housemaid, born in South Australia, was admitted to hospital on November 18th, 1922, complaining of a lump under the right arm. About a month before admission she had noticed the lump, which had gradually grown larger, though causing no pain or discomfort. Her general health had been good. She had detected no other lumps elsewhere in the body.

On examination, she was a healthy-looking girl. In the costal wall of the right axilla there was a rounded tense tumor, which seemed to contain fluid, but was not fluctuant. The fibres of the pectoralis major muscle were stretched over it. The swelling was a little larger than a hen's egg, was somewhat adherent to the deeper structures, and was single. No enlarged glands were detected, either near it or elsewhere. No abnormality was detected in the chest or abdomen. A blood examination on November 21st showed a leucocyte count of 12,000 per c.mm., comprising 70% of polymorphonuclear cells, 24% of lymphocytes, 2.5% of large mononuclears, 2% of eosinophile cells, and 1.5% of transitional cells.

On November 20th an incision was made over the swelling, and deepened until a fibrous capsule came into view. On dividing this cautiously a bluish thin membrane came into view, and a cyst was expressed entire. It was larger than a hen's egg, and had a bluish transparent membranous wall. The wound was sutured with silkworm gut. The pathologist's report confirmed the diagnosis of an hydatid cyst. Skiagraphs revealed no evidence of hydatid cysts in the lungs or liver, but the splenic outline was large. Blood serum taken on November 21st gave a negative complement fixation test for hydatid disease, the result being confirmed by Dr. Patterson in Melbourne.

Comment.—The interesting features in this case are:—(1) The unusual location of the cyst; (2) the absence of eosinophilia; and (3) the failure of the complement fixation test.

(7) DEGENERATED HYDATID CYSTS OF THE PERITONEAL CAVITY.

The following example of a degenerated hydatid cyst was found accidentally during the course of *post-mortem* examinations:—

Autopsy, No. 91/22.—Mrs. O. M., *æt.* 49, was admitted on July 5th, 1922, with a history of biliary colic. Glycosuria and acetonuria were present. An operation was performed for a gallstone in the common bile duct. The patient died on July 21st, and the autopsy showed an escape of bile into the peritoneal cavity with plastic peritonitis around the gall bladder and a contracted gall bladder containing a large, irregular facetted stone, with smaller stones in the dilated ampulla of the cystic duct. The patient gave a history of having had hydatid disease, an operation having been performed for removal of such a cyst from the uterus about seven years ago. At the autopsy, on the diaphragm laterally near the attachment of the right lobe of the liver a small tumor was met with, consisting of crumpled breaking-down hydatid membrane, with another still smaller mass still more laterally situated. These small breaking-down cysts had not given rise to any symptoms.

II.—CASES RESEMBLING TYPHUS FEVER (Brill's Disease?).

Subjoined are notes of the series of cases which were admitted to the medical wards during the past year, which in their clinical appearance and serological reactions closely resemble typhus fever. The different cases have been under the care of Drs. Angas Johnson, C. T. de Crespigny, F. S. Hone, and D. Cowan. The notes of a previous series of cases which were observed in the wards from 1918 to 1921 may be found in *The Medical Journal of Australia,* January 7th, 1922. Besides those here recorded, other cases have been noticed outside the hospital during the past year in different suburbs of Adelaide. An account of the serological tests on these, undertaken by Dr. Bull, and the notes of a few of them, appear in an article in

The Medical Journal of Australia, April 21st, 1923, pp. 435-445. The cases here recorded are of special interest in that they include the first instances of the disease occurring in women, and one of them is younger in age than any cases yet recorded.

The cases of C. M. and A. K. are also interesting, because they were two out of a group of five which occurred in two adjoining houses at Hindmarsh. This is the first instance of any group since the frequent occurrence of cases amongst wheat lumpers on the weevilly wheat stacks in Port Adelaide in the winter of 1918. It is difficult to say whether the present group is an instance of house or occupational incidence, since the premises included a shop in which A. K. served, as well as the members of the household. The case of A. P. is interesting in that although this occurred in August, 1921, a case of the same disease in the same house was observed in February, 1923, with no illness in the house in the meanwhile. It will be noticed that all the cases are of much the same type the headache being the marked feature in the first week, the rash appearing on the fifth to seventh day of illness, and defervescence occurring about the twelfth to fourteenth day. There have been no deaths in this series, and the only complications observed have been pleurisy in one case and broncho-pneumonia in two, these last two cases only being admitted to hospital when the broncho-pneumonia was appearing.

Case 1.

(*Under the care of Dr. Hone.*)

G. A., *æt.* 56, a laborer, residing at Bowden, was admitted to Verco Ward, on February 23rd, 1922. His illness had begun seven days previously with pain in the upper abdomen and flatulence after food. For some weeks previous to the onset he had been laboring at a new pipe track being constructed for sewerage at Richmond. Two days after the onset he had shivering attacks and feverishness with headache, loss of appetite, and cough. There had been no epistaxis or vomiting, the bowels had acted with medicine, the urine had been dark in color. He had been feeling weak and tired for 13 days before admission. Prior to this there had been nothing abnormal in his past history: he had been a moderate drinker, and denied any attack of venereal disease. The family history was good.

He was admitted as a case of typhoid fever. On examination on admission the temperature was 101°, respirations 22, pulse 68, regular, full, of low tension. The patient looked torpid, but was in no apparent distress. The tongue showed a dirty white fur, the teeth were absent, the throat normal, the heart sounds were inaudible, there were scattered rhonchi and rales at the bases of both lungs posteriorly with a normal percussion note here and elsewhere. The abdomen was slightly full, with slight general tenderness, and the edge of the spleen was palpable. A scattered roseolar rash was noted over the abdomen and chest. The urine was 1020, acid, no albumin. A blood culture on February 23rd was negative; the Widal test was negative on February 24th; an examination of the fæces and urine on February 25th revealed no Bacillus typhosus. By February 27th the rash was noted as having faded and the temperature was lower. On February 28th the blood did not agglutinate Bacillus proteus x 19. By March 3rd the tempera-

ture was normal and the patient was hungry and felt well. Except for a slight attack of dry pleurisy on March 10th, with a friction rub in the left axilla, he convalesced normally.

A specimen of blood was sent to the Commonwealth Serum Laboratory on March 7th. By the time it reached Melbourne the serum had soaked into the cotton wool with which the tube was plugged, and the clot had started to dry. These were separately extracted with a small quantity of saline: the cotton wool extract agglutinated Bacillus proteus x 19 in a dilution of 1: 10 after two hours in the water bath at 37° C., and in a dilution of 1 : 80 after 24 hours at room temperature. The extract from the clot agglutinated in a dilution of 1 : 80 after 2 hours in the water bath at 37° C., and in a dilution of 1 : 320 after 24 hours at room temperature.

Another specimen of blood examined at the Adelaide Hospital Laboratory on March 16th gave a complete agglutination to Bacillus proteus x 19 in dilutions of 1 : 20 and 1 : 40; partial at 1 : 80.

Case 2.

(*Under the care of Dr. C. T. de Crespigny.*)

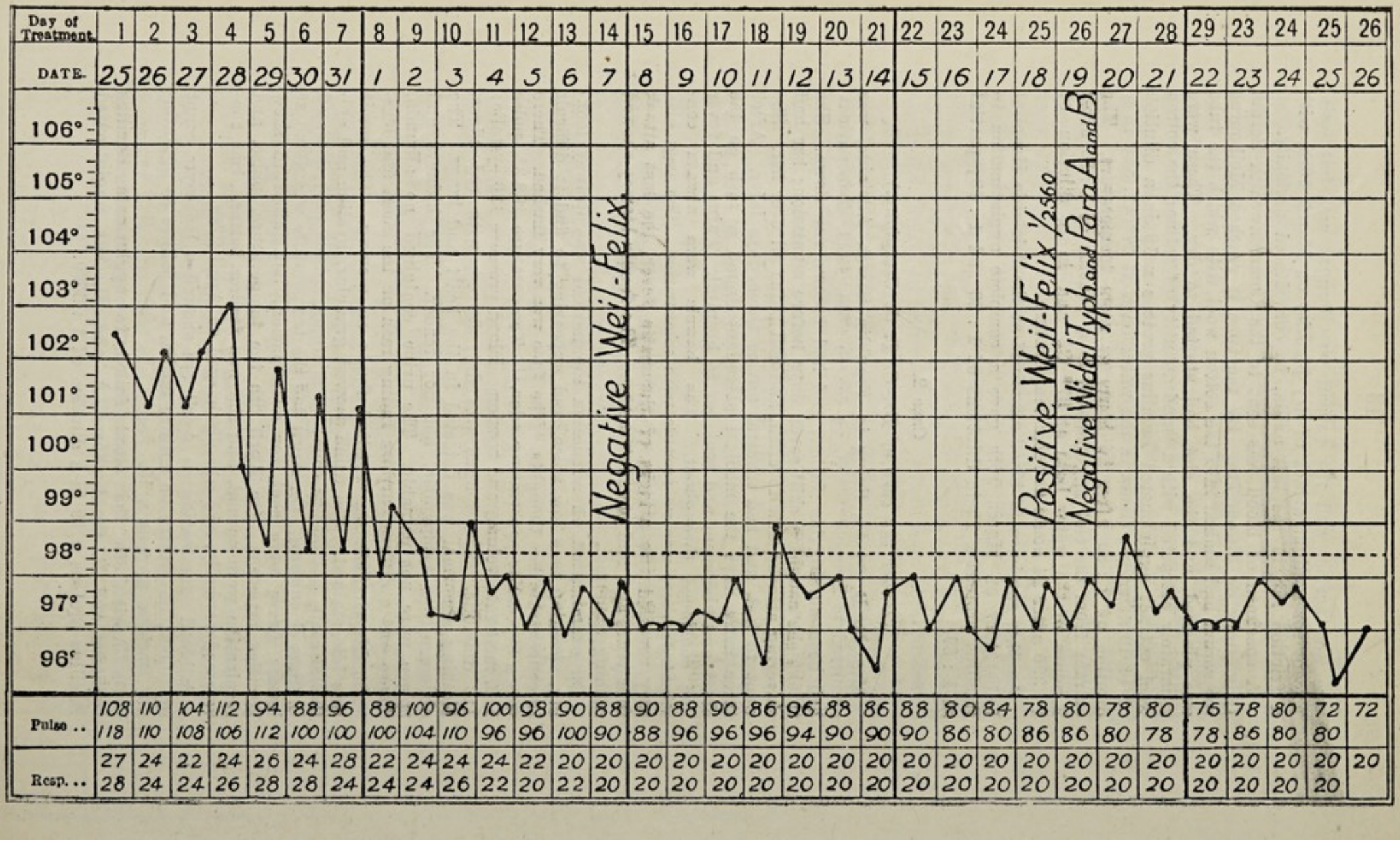
Mrs. B. R, *æt* 51, living in Franklin Street, Adelaide, was admitted to Leopold Ward, on March 25th, 1922. The patient had been nursing her father, and had become run down. She thinks she caught a chill seven days before admission; she had shivering attacks, felt feverish, and had pains all over her. She went to bed, and had medical advice three days later. After three more days the medical attendant found a rash on the chest and abdomen, and sent her to hospital. Pains and fever had continued throughout. The bowels were always constipated; there was no trouble with micturition. The past history revealed two attacks of rheumatic fever, the last attack four years ago, and pneumonia once. The family history showed nothing abnormal.

On examination on admission the patient was drowsy looking, speaking in a low voice, and appearing to find it difficult to concentrate her thoughts. The face was very flushed. There was a "peculiar penetrating odor." Temperature 102.3°, pulse 112, moderate volume and tension. Blood pressure 120 systolic: 110 diastolic. The tongue was dry, furred, with red edges. Nothing abnormal was detected in the heart and lungs. The abdomen was tympanitic, but not tender. The kidneys and spleen were not palpable. The urine contained no albumin. There was a diffuse purplish fading rash on the chest and legs.

On March 29th she vomited fluids on moving. The vomit was bile stained. The urine showed granular, hyaline and epithelial casts, but no pus cells; no micro-organisms were detected in films or cultures. On April 2nd the temperature was noted as lower; fæces were sent for examination, but failed to show Bacillus typhosus. On April 6th the temperature, pulse, and respiration were normal, and she was feeling better. She convalesced normally, and was discharged on April 27th.

A blood examination on April 7th showed a leucocyte count of 10,600, no growth on culture media, and failure to agglutinate Bacillus proteus x 19.

On April 18th the blood failed to agglutinate Bacillus typhosus and B. paratyphosus A and B, but agglutinated Bacillus proteus x 19 in a dilution of 1 : 2560.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Case 3.

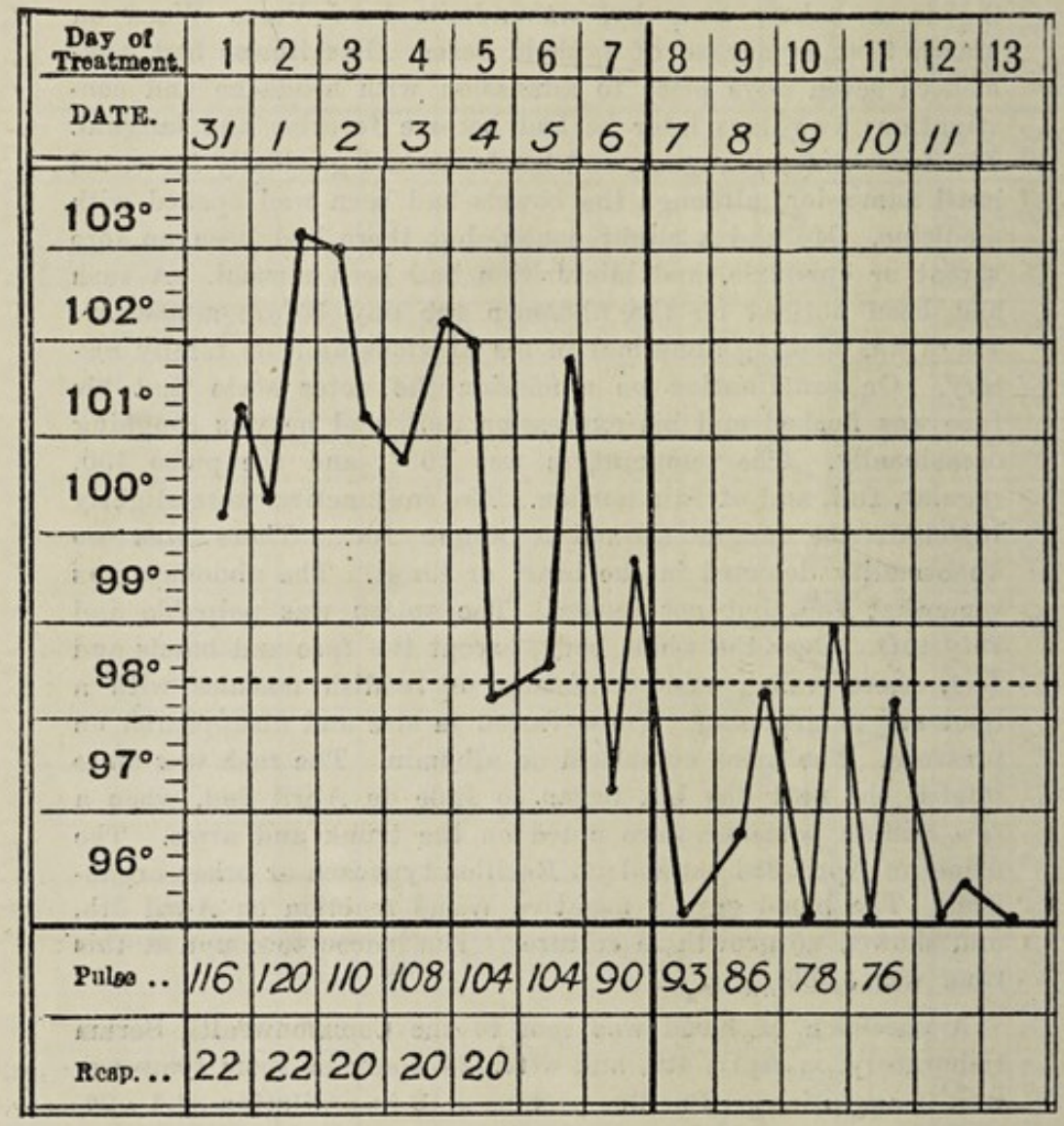
(Under the care of Dr. Hone.)

C. M., *æt.* 14, living at 69, Port Road, Hindmarsh, and working in a bakery near by, was admitted to Verco Ward on March 31st as a case of typhoid fever. His illness had commenced seven days prior to admission with headache and constipation; two days later he had become feverish and languid. The feverishness, languor, and headache had gradually increased until admission, although the bowels had been well opened with medicine. He had a slight cough, but there had been no sore throat or epistaxis, and micturition had been normal. A rash had been noticed on the abdomen the day before admission. There was nothing abnormal in his previous and his family history. On examination on admission the notes state that his face was flushed and his expression dull, and he was coughing occasionally. The temperature was 103°, and the pulse 130, regular, full, and of fair tension. The conjunctivæ were slightly injected; the tongue showed a slight fur. There was no abnormality detected in the heart or lungs. The abdomen was somewhat full, but not tender. The spleen was palpable and very soft. Over the whole body, except the face and hands and feet, there was a rash consisting of reddish macules with a tendency to grouping. These varied in size and disappeared on pressure. The urine contained no albumin. The rash was more intense the next day but began to fade on April 2nd, when a few minute petechiæ were noted on the trunk and arms. The urine on April 3rd showed no Bacillus typhosus or other organisms. The blood gave a negative Widal reaction on April 5th, and showed no growth in culture. The leucocyte count at this time was 3,900.

A specimen of blood was sent to the Commonwealth Serum Laboratory on April 4th, and after 24 hours at room temperature it agglutinated Bacillus proteus x 19 in a dilution of 1 : 20, and partially in a dilution of 1 : 40. A specimen at the Adelaide Hospital Laboratory on April 5th gave complete agglutination in dilutions of 1 : 20 and 1 : 40, and partial in a dilution of 1 : 80. On April 11th a specimen of blood at the Adelaide Hospital Laboratory gave complete agglutination in a dilution of 1 : 320, and partial in a dilution up to 1 in 1280. At this time he was convalescent, and he was discharged from hospital on April 26th.

On April 24th another specimen of blood was sent to the Commonwealth Serum Laboratories, and this gave a complete agglutination after 24 hours in a dilution of 1 : 40. On April 26th another specimen in the Adelaide Hospital Laboratory gave no agglutination.

This boy lived at the rear of a sweets and cool drink shop. He was very fond of eating "walnut lollies" in the shop, which he said were "weevilly."



Case 4.

(Under the care of Dr. Hone.)

Mrs. A. K., *æt.* 42, was admitted to Alexandra Ward on May 28th. She lived next door to case 3, and helped in the shop in the evenings. The boy's mother and father had been ill with the same disease in the interval, and she had helped to nurse them. Her illness had begun seven days before admission with stiffness in the legs and forearms, mostly in the joints. The next day pain came on in the chest, which was relieved by "Aspro." A few days later she got very severe headache, which gradually got worse till her admission, of a constant and severe character, sometimes throbbing and "too sore to lie on." Her medical attendant noticed a rash six days after the onset.

On examination on admission the patient had a flushed face, the temperature was 101°, and pulse 110, of good volume and tension. The tongue was flabby and coated with white fur. The conjunctivæ were injected. There was tenderness at the back of the neck and pain here on moving the head. Nothing abnormal was detected in the heart, lungs, or urine. The abdomen was full, but not tender. There was an extensive rash over the chest, abdomen, and back, with some spots on the cheeks, forehead, and arms. On the legs it only extended to the buttocks and upper thighs. It consisted of scattered macules and papules, pinkish in color and disappearing on pressure. Some spots were raised and up to ¼in. in diameter, and the skin was mottled in places. On the back there were a few punctiform spots not disappearing on pressure. The majority of the spots were on the chest, abdomen, and back.

On May 29th the leucocyte count was 9,000, and her headache had been relieved with bromide and chloral. On May 31st the patient was still feverish; the Widal test was negative. By June 2nd the temperature was normal, and the rash had gone, the patient thence convalescing normally, and being discharged on June 13th.

A Widal test done on May 31st was negative. On June 3rd the blood gave a complete agglutination to Bacillus proteus x 19 in a dilution of 1 : 320, and partial in a dilution of 1 : 1280. On June 13th it gave complete agglutination to a dilution of 1 : 160; partial, 1 : 320.

Case 5.

(Under the care of Dr. Angas Johnson.)

Mrs. O. E., *æt.* 27, living in Waymouth Street, Adelaide, was admitted to Alfred Ward on June 10th, 1922. She had been taken ill seven days previously with cold shivers: she had been quite well the previous day. Aching pains came on across the shoulders and in the muscles of the arms and the small of the back; these became worse towards night, and had been present ever since. Headache commenced three days before admission; this was chiefly frontal, "like a nerve jumping," and was worse when she tried to sleep. She had had no epistaxis, nausea, vomiting, or diarrhœa; the bowels were constipated. Sleeplessness had been troublesome, although she had been in bed since the onset. A rash had been noticed four days after the beginning of the illness; this was not itchy. Her brother had been ill with influenza two weeks previously, and a man next door had had cold shivers three weeks before, but did not lay up. There was nothing else abnormal in her past or family history.

On examination on admission the face was flushed, the temperature 103°, pulse 104, respirations 24. The leucocyte count was 6,875. The pupils were dilated; the breath had an unpleasant odor; the tongue showed a thick brown fur. Nothing abnormal was found in the heart, lungs, or abdomen. The urine contained a slight amount of albumin. The skin was dry and hot; there was an indefinite rash on the cheeks, and a scattered macular and papular rash over the trunk and arms. The macules disappeared on pressure; there was no grouping; some of those on the back looked like acne spots.

On June 13th the blood gave partial agglutination to Bacillus proteus x 19. On June 28th the blood gave complete agglutination to Bacillus proteus x 19.

Case 6.

(*Under the care of Dr. Hone.*)

Mrs. E. P., *æt.* 52, domestic servant, living at East Adelaide, was admitted to Alexandra Ward on July 28th, 1922. Her present illness had commenced on July 22nd. She had not "felt herself" for a week previously; she had worked, but felt tired and had no appetite. On July 22nd she felt dizzy, and then had cold shivers. She got up at noon for two or three hours for the next six days. She had no appetite. There was no abdominal pain; the bowels acted regularly. She vomited once on July 27th. On July 28th she had severe headache and began to cough, with easy expectoration of thick phlegm. She vomited twice more that day. She had had pneumonia and pleurisy 22 years before. The rest of her past history and family history was unimportant.

On examination on admission the patient looked languid, and her face was flushed; temperature 101°, pulse 104, respirations 22. The tongue had thick fur on the dorsum and the breath was offensive. The hair was infested with pediculi. An examination of the heart revealed nothing abnormal, but there was an impaired percussion note over the base of the right lung posteriorly, the breath sounds were slightly diminished, and scattered rhonchi were heard. In the abdomen the spleen was just palpable. The urine was acid, Sp. Ggr. 1030, no albumin or sugar.

It was noted that subcuticular mottling of the skin of the abdomen caused the striæ albicantes to show up pink, and obscure the rash which was papular over the abdomen. There were some macules, and some spots disappeared on pressure. The red blood count was 5,250,000; the white count 16,000. The headache remained severe for a few days, and the spleen became more easily palpable and enlarged until August 4th, after which it decreased in size again. The rash had disappeared by August 2nd, and the temperature had fallen to normal. The pneumonic condition in the lung cleared up, and she convalesced normally, being discharged from hospital on August 17th.

The blood gave complete agglutination to Bacillus proteus x 19 in a dilution of 1 in 2560 on August 4th, in a dilution of 1 in 5120 on August 10th, and in a dilution of 1 in 1280 on August 17th.

Case 7.

(*Under the care of Dr. Cowan, Honorary Assistant Physician.*)

C. W., female, *æt.* 22, married, was admitted to hospital on September 28th, 1922. Her present illness had commenced 10 days prior to admission with sudden headache and pains between the shoulders and in the limbs. She became "hot and feverish," had epixtaxis, and vomited once or twice shortly after the onset. She had had a rigor early in the illness. A rash appeared on the third day, which was first noticed on the arms. The bowels as a rule acted normally, but during

the present illness had been constipated. Micturition and menstruation were normal. The patient states that she had never been really strong, and had had oophorectomy four months ago.

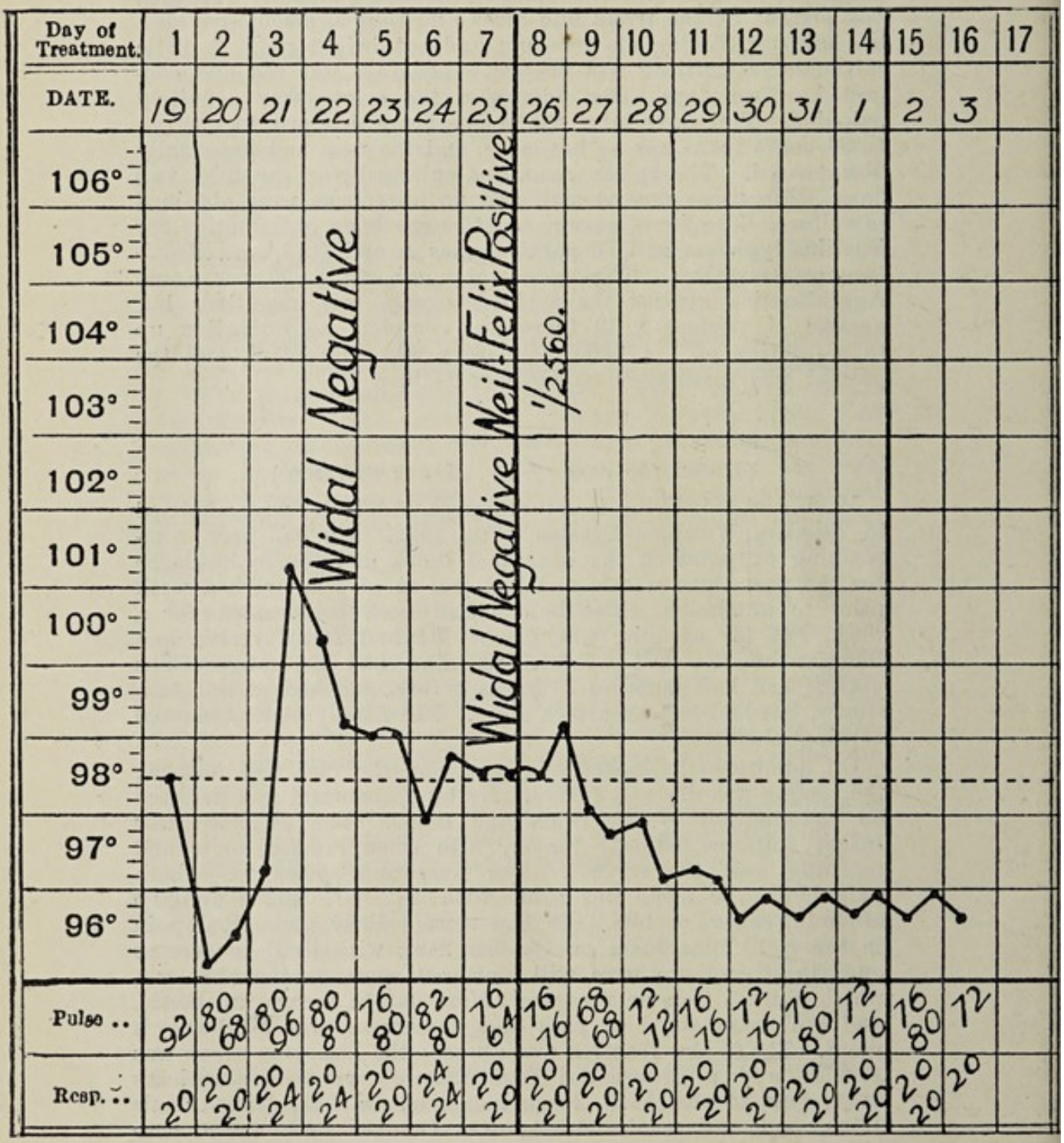
On examination, the patient was a young woman, lying in bed complaining of severe frontal headache. Temperature 103°, pulse 100, respirations 26. An examination of the heart and lungs was negative. The spleen was not palpable. A rash was present on the trunk and arms and thighs, maculo-papular in character, fading on pressure, and not bright red. A little subcuticular mottling was present. The face was red and congested. Two days after admission the spleen was definitely palpable. Two days later the temperature dropped to normal. In 24 hours there was no headache, and the rash had practically disappeared. The spleen remained enlarged for the next two days. The urine was normal, and no organisms were obtained in culture. The fæces gave a negative result on examination for Bacillus typhosus and B. paratyphosus A and B. A blood culture was negative. The leucocytes numbered 8,000 per c.mm. Agglutination against the typhoid group was negative, but against B. proteus x 19 there was complete agglutination up to a dilution of 1 : 2560. Recovery was uneventful, and the patient was discharged on October 17th.

Case 8.

(*Under the care of Dr. Angas Johnson.*)

W. L., *æt.* 54, living in Sturt Street, Adelaide, was admitted to Flinders Ward on October 19th, 1922. He had been complaining of pains in the back and limbs and severe headache for the past three weeks, and had had to give up work a week prior to admission. The bowels had been constipated for a week, but the appetite was good. He had felt feverish, and thought he had lost weight. He had had no cough. The patient had had jaundice 34 years before, and had passed gallstones, but had had no attack since. The family history showed nothing abnormal.

On admission he looked apathetic and the face was flushed; the tongue was dry and furred. Nothing abnormal was detected on examination of the heart and lungs. The abdomen was rather full and slightly tender, with some reddish spots and mottling over the surface. The liver and spleen were both palpable. The urine was acid, with Sp. Gr. 1020, and no albumin, sugar, or bile. He had some colicky abdominal pain in the right iliac fossa on October 21st, with local tenderness and rigidity; there were still scattered spots on the abdomen, which did not fade on pressure. Next day he seemed apathetic, and still complained of pain and tenderness over McBurney's point. The Widal reaction was absent; the leucocyte count was 10,000; and a differential count showed polymorphonuclears 80%, lymphocytes 14%, large mononuclears 3%, transitionals 1.5%, and eosinophiles 1.5%. On October 24th there were diminished breath sounds at the base of the right lung posteriorly, and the leucocyte count was 23,000. There were no B. typhosi in the fæces or urine. On October 25th the Widal reaction was absent, but the blood completely agglutinated Bacillus proteus x 19 in a dilution of 1 : 2560. The patient convalesced normally, and was discharged on November 3rd.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III.—NERVOUS SYSTEM.

(1) GLIOMA INFILTRATING THE CORPUS CALLOSUM.

(*Under the care of Dr. de Crespigny, Honorary Physician, and Dr. Cudmore, Honorary Surgeon. Notes by Dr. C. Turner and Dr. D. L. Barlow.*)

J. J., *æt.* 41, a laborer, born in South Australia, was admitted on July 7th, 1921. An exploration of the left Rolandic area was made on December 19th, 1921, when cerebral compression was found. Death occurred on March 22nd, 1922. At autopsy a glioma was found on the mesial aspect of the left cerebral hemisphere, extending into the corpus callosum.

When seen after admission, the patient stated that 12 months previously he had noticed a cramp in the toes of the right foot. At first the cramp occurred every few days, but gradually increased in frequency and extent, and then affected the leg up to the knee. Soon afterwards the leg began to quiver when the cramp occurred. The attacks subsided in frequency and severity during the later summer months, but with the winter they had become worse, and had progressed in severity and frequency so that at the time of admission he was having frequent attacks daily. During the attack the big toe became bent downwards and stiff, then the toes twitched, and finally the muscles of the calf twitched. In severe attacks the twitching extended to the back of the thigh, and occasionally the muscles on the right side of his abdomen twitched. On one occasion the twitching affected his right shoulder and arm. The attacks were precipitated by, and more severe after, exertion, but were less severe and less frequent if he rested. There was no headache. His appetite and digestion were normal. His bowels acted regularly. There were no urinary symptoms. He was not losing weight. He had worked underground at Broken Hill for 15 years, but had not been "leaded." He had been at the war, and was slightly "gassed" in France, but was ill for a few days only. He had had gonorrhœa 20 years previously. He smoked tobacco, and drank beer moderately.

Examination revealed the following:—He was a healthy-looking man. The pulse was 88 per minute, of good volume and high tension. The arteries were not palpably atheromatous. The pupils reacted to light and accommodation, and were equal in size. There were no signs of ocular paresis, but a slight lateral nystagmus was noticed. The fields of vision were contracted, but there was no hemianopia. There was pyorrhœa alveolaris. Examination of the chest and abdomen revealed no abnormality. The knee jerks were active, more so on the right side. The plantar reflex was not elicited, excepting after a spasm, when a bilateral Babinski was found. The supinator and biceps muscles reacted normally. The urine was normal. The gait was unsteady, and rombergism was present. He walked with the right leg held stiffly, the knee slightly flexed, and the foot dorsiflexed so that he walked on his heel. He was unable to recognise the changes in position of the whole leg. Sensations to heat and cold, and to tactile stimuli, were normal. When seen in an attack it was observed that the right hallux became dorsiflexed and the tibialis anticus muscle began to contract clonically, the foot being inverted and plantarflexed. The knee became slightly flexed, and finally the quadriceps contracted clonically. Consciousness was not lost. The Wassermann Reaction of the blood and cerebro-spinal fluid was negative (also on frequent occasions during his stay in hospital).

Subsequently to the above observations, and extending over a period of five months, during which time he was often out of bed and getting about, the symptoms progressed. The following is a resume of his progress:—The twitching of his muscles became gradually more extensive, and affected the whole of the right leg, the left pectoralis major, the deltoid, and trapezius. Later the left foot was affected. The attacks commenced with a tonic spasm of the affected muscles, and this was followed by clonic contractions at the rate of about 23 per minute. In August, 1921, he complained of a heavy feeling in the head which "nearly made him fall down." The severity of the headache varied. The speech remained normal. In September, 1921, the headache became very severe, he was irrational on occasions, and he began to vomit. There were some recent hæmorrhages below in the retinal discs. The memory was then beginning to fail. On November 16th, 1921, he complained of severe giddiness, and during a spasm there was a partial loss of consciousness. Vision was then reduced after the attack, and objects were seen as through a mist. One week later he had twitching in both arms, associated with unconsciousness. After the attacks his memory was much affected. There was lateral nystagmus. Sensation to light touch was delayed, and to the pin prick was indistinct. He could recognise hot and cold test tubes if the variations in temperature were wide. He was losing his power of attention. The picture was that of a complete cerebro-paresis with an irritative lesion affecting the right foot and leg, but "exploding" in variable extent to the area represented by the right thigh, shoulder, and arm, and sometimes overflowing to the opposite foot and shoulder.

It was decided to explore the left Rolandic area. On December 19th, 1921, an extensive area of bone was removed, and the brain inspected over the exposed area. It was normal in consistency, and no tumor was palpable. After an unsuccessful attempt to tap the left lateral ventricle with a trocar, the dura mater was brought loosely into position, and the scalp wound was closed. After operation the wound healed, but a large hernia cerebri developed, and there was a right hemiplegia. He remained in a stuporous condition, but could be roused to attention. On January 31st, 1922, his right leg was placed in splints, because of the condition of contracture. Speech gradually became incoherent and slurred, and finally unintelligible. On March 10th, 1922, he could not recognise his friends, and did not understand what was said to him. He became completely unconscious on March 21st, with stertor, and died the following day.

Findings at Autopsy (No. 26/22).—A large hernia cerebri was present, and the membranes over this area were lightly adherent to one another. The convolutions here were flattened. On the mesial aspect of the left cerebral hemisphere adjacent to the Rolandic area an infiltrating gliomatous tumor could be seen affecting an area about 3.75 cm. in diameter. The corpus callosum also showed a gliomatous mass at about the junction of its middle and posterior thirds. On sectioning the brain after hardening, these areas were found to be continuous, and the left hemisphere was apparently infiltrated to a depth of about 3.75 cm. from its mesial surface.

Localisation and Extent of the Neoplasm (Dr. T. Grant).—A mass 8.5 cm. long and 10.5 cm. in greatest width occupied

the greater part of the corpus callosum. Anteriorly this structure was invaded to within 1.5 cm. of the genu. Posteriorly the growth extended into the splenium. The growth caused projections into both lateral ventricles, more especially on the left side. On the left side it had extended upwards to involve the superior portion of the cortex posterior to the sensory area, and extended forwards probably as far as the upper portion of the motor area. Owing to this part of the brain being pressed out of shape, and portion being missing, it was difficult to ascertain precisely the anatomical extent in this part.

Microscopical Appearances.—The growth is very cellular, the cells being closely packed. There are extensive necrosed areas. The cell outlines are indefinite, but merge in places apparently into a felted network of fibrils. The nuclei are prominent, vesicular, and oval or irregular, and vary in size in different places. In any one part of the section the cells closely resemble each other, but may differ from those in other parts. Between the tumor cells are a number of largish vascular channels, as well as capillaries. Some of these channels show connective tissue walls of considerable thickness, others little beyond the lining endothelium. From some of the latter hæmorrhages have occurred. Collections of golden pigment in some of the cells are evidently derived from such old blood extravasations. In places the vascular channels seem almost angiomatous, a number of them traversing irregularly fairly dense fibrous tissue. The growth is gliomatous.

(2) GLIOMA OF THE TEMPORAL AND PARIETAL AREAS.

(Under the care of Dr. de Crespigny, Honorary Physician. Notes by Dr. D. L. Barlow.)

R. K., a male, *æt.* 48, was admitted to the Adelaide Hospital, but owing apparently to mental confusion, was unable to give any account of himself. His wife stated that he had been ill for about four weeks. The first symptom was headache, then after a week he had a fit, and subsequently mental aberration was noticed. Two months earlier than this his eyesight had begun to fail, and he had vomited on several occasions. On examination, the patient was found to be unable to answer questions intelligibly. He seemed to have difficulty in expressing what he wished to say. There was no facial or hypoglossal paralysis. No paralyses were noted in the arms, legs, or trunk. The knee and ankle jerks were moderately active. The plantar reflexes were extensor in character. The optic discs showed blurred outlines, especially on the right side. Several fits, in which the patient did not completely lose consciousness, occurred at intervals, and the patient died eight days after admission. The laboratory findings of the cerebro-spinal fluid were as follows:—No globulin present, and only a few lymphocytes. No tubercle bacilli detected. Wassermann reaction negative.

Autopsy (No. 8/22).—The convolutions of the brain were flattened over the left temporal and lower parietal areas and the brain substance soft. On section a large soft gliomatous tumor occupied the white matter external to the descending horn of the lateral ventricle, and extended down into the same side of the mid-brain. Small scattered hæmorrhages appeared throughout.

Microscopical Appearances (Drs. Cleland and Bull).—Sections show numerous cells, varying much in size and shape, lying in a matrix of interlacing fibrils, many of which can be traced to the cell. Fine capillary vessels, lined by elongated endothelial cells, and large vascular channels, insinuate themselves through this matrix. The vascular channels in places become more numerous and even angiomatous looking. In some places the tumor cell shows a definite and relatively large amount of cytoplasm, and contains usually an excentric nucleus and suggests a more differentiated nerve cell. Mitotic figures occur, but are rare. There are extensive areas of necrosis. Scattered irregularly in the neighborhood of the periphery of these are collections of old blood pigment, included in large vesicular or elongated cells. The growth is gliomatous.

(3) NEUROBLASTOMA PROJECTING FROM THE LEFT CRUS CEREBRI.

(*Under the care of Dr. Hone, Honorary Physician. Notes by Dr. Gartrell.*)

Mrs. M. F., *æt.* 43, was admitted on September 4th, 1922. Her trouble had commenced 12 months previously in the form of frontal headaches, which had become more frequent lately. Two months afterwards she developed optic neuritis. She also suffered from tinnitus and vertigo. She had been vomiting, but this was not related to her meals. Her memory for recent events had become poor during the last six months.

On examination the patient was found to be a well-nourished woman, almost blind with intense bilateral papillœdema. She could stand with difficulty on the right leg, but was unable to stand on the left leg. She fell to the left off either leg. She walked evenly. By lumbar puncture clear fluid under high pressure was withdrawn, which gave a negative test for globulin, reduced Fehling's solution, and yielded a negative Wassermann reaction. No blood cells and no excess of lymphocytes were found in it. The blood gave a negative Wassermann reaction and a negative complement fixation test for hydatid disease. X-ray examination showed an enlarged pituitary fossa with bony destruction, and total destruction of the posterior clinoid processes. Otherwise a complete physical examination revealed nothing abnormal. Two weeks after admission the patient had twitching of the left arm and leg with spasticity, followed later by flaccidity. Decompression was done in the right temporo-sphenoidal region, and intense intra-cranial pressure was found. The dura mater was incised and the soft tissues sutured. Later the pulse and respiration rates rose, and the temperature reached 102° F. Consciousness was not regained.

At the partial *post-mortem* examination lacerated brain substance was found beneath the decompression wound, and a hard tumor, the size of a walnut, was found in the mid-brain.

Localisation and Description of the Tumor (Dr. T. Grant).—A rounded tumor, measuring 2 x 1.7 cm., springs from the superior surface of the inner end of the left crus cerebri, immediately adjacent to the corpora quadrigemina. The tumor is definitely circumscribed and almost pedunculated, being attached by a base about half the diameter of the tumor itself.

Microscopical Appearances (Drs. Cleland and Bull).—The tumor consists of numerous cells of medium size, with irregularly

rounded or oval or more irregular nuclei, welded together by a matrix of very delicate fibrils. In places the nuclei of the cells tend to arrange themselves in a condensed fashion in a wavy line around the edge of areas almost devoid of nuclei. With a low power, nerve fibrils (deeply stained by the iron hæmatoxylin) traverse the matrix in various directions, tending to give a somewhat alveolar appearance to the cell masses. These nerve fibrils are moderately fine to coarse, and frequently show irregular varicose-like swellings or present a beaded appearance, and exhibit frequent bends, sometimes nearly at right angles. They are sometimes seen apparently commencing in an irregular bulbous, deeply-stained swelling, from which a gradually attenuating long fibre emerges. There may be branching near the bulbous end. These fibres could not be actually traced to cells. Occasionally, apparently in cells, may be seen several rounded spherules, or a curved or horseshoe-shaped granular thread, all deeply stained like the fibrils. The cells of the growth only rarely approach in size to ganglion cells. They are polymorphous. The edge of the protoplasm is usually indefinite, seeming to merge in the fine fibrillar matrix. Some cells contain more than one nucleus. Occasionally the cells seem to form indefinite syncytial-like masses, surrounding capillary channels filled with red cells. The growth is extensively penetrated by capillary vessels, some exceedingly delicate, others with well-marked walls. There are a few larger vascular channels. In the centre of the growth is a mass of degenerated tissue in a large space. This shows elongated slits suggestive of the sites of cholesterol crystals. A group of hæmatoxylin-stained granules indicates incipient calcification. The growth is a neuroblastoma showing differentiation in the direction of the formation of definite nerve fibrils.

(4) GLIOMA AFFECTING BOTH FRONTAL LOBES.

(*Under the care of Dr. Hone, Honorary Physician. Notes by Dr. Bronson.*)

E. D., male, *æt.* 53, was admitted to the Adelaide Hospital on April 7th, 1922, with a diagnosis of migraine, cerebral tumor, or encephalitis lethargica from the Military Hospital. On March 30th he had been admitted to the latter hospital, complaining of violent occipital headache. His mind was wandering, and he could not give a clear account of himself. His son stated that he had been fairly well until about a fortnight previous to admission, when he went "queer in his head." He thought he was becoming insane. He gradually grew worse. The patient was a sick-looking man, with a temperature of 98.7° F., and a pulse of only 48. On April 2nd he was worse, and had projectile vomiting. The pulse was 44. On April 4th lumbar puncture yielded turbid fluid under pressure, the turbidity settling on standing. The pupils were equal, and reacted to light and accommodation. The plantar reflexes were flexor in type. The superficial abdominal reflexes were absent. He had no ataxia. On April 5th he was passing urine and fæces into the bed, but was not unconscious. The diagnosis of tumor was abandoned on account of the method of onset, and an inflammatory condition by the absence of temperature. Provisionally, the diagnosis of encephalitis lethargica was made.

On examination at the Adelaide Hospital the patient presented a somewhat vacant expression, and answered questions slowly but irrationally. He was childish in his conduct, and

could not concentrate his mind in answering questions. He had control of his sphincters. The temperature was 98° F., respirations 20, and pulse 60. The pupils were equal, and reacted to light and accommodation. There was pseudo-nystagmus through lack of attention. The tongue was protruded in the midline. The knee jerks were increased on both sides. The plantar reflexes were flexor in type. The wrist jerk and testicular reflex were absent on the right side. There was no superficial abdominal reflex. The patient walked unsteadily with a wide base. There was no definite rhombergism. The abdominal and thoracic organs appeared to be normal. The urine was acid, with specific gravity 1020, no albumin, and no sugar.

On April 10th, 10 c.c. of clear fluid under pressure was removed by lumbar puncture. This gave a positive ammon. sulph. reaction and a negative Wassermann reaction; it showed no increase of lymphocytes, and no tubercle bacilli or other organisms. On April 12th there was restlessness, especially at night. The patient micturated and defæcated anywhere. He appeared more childish in his conduct, and had had three attacks of projectile vomiting. On April 27th the patient was quieter and much more rational. By May 10th he had no vomiting, but was gradually losing condition. He could not recognise his friends, and lay in a dreamy state. On striking the muscles there was localised fibrillary contraction. There was no cranial nerve involvement. His habits were dirty. On June 6th he lapsed into coma after having improved in mentality, and died. The examination of the eyes by Dr. Shorney showed the veins very tortuous and œdema of the retina with hæmorrhages, but the patient would not allow a proper examination to be made. His temperature was normal throughout, except for an occasional rise to 99° or 99.6° F. In the Adelaide Hospital his pulse rate was usually about normal, occasionally as low as 60 and sometimes up to 106.

Post-mortem examination revealed a gliomatous tumor occupying the mesial aspects of both frontal lobes.

Extent of the Neoplasm (Dr. T. Grant).—A mass occupies the anterior part of the mesial aspect of both cerebral hemispheres. On the left side the mass measures 7 cm. in length; it is broader anteriorly where the greatest measurement is 5 cm., and from this point it tapers to its posterior extremity. In depth the mass extends 1.5 cm. from the mesial aspect of the brain. The posterior extremity is situated above the corpus callosum and just anterior to the centre of this portion of the brain. The anterior extremity is about 1.5 cm. from the frontal pole. The grey matter of the lateral aspect of the brain is not involved. On the right side the mass measures 5 cm. in length; anteriorly it is as broad as 5 cm. The greatest depth from the mesial aspect of the hemisphere is 1.3 cm. The posterior extremity is situated above the corpus callosum about 2.5 cm. posterior to the genu. The anterior extremity is 1.5 cm. from the frontal pole. The grey matter of the lateral aspect of the brain is not involved.

Microscopical Appearances (Drs. Cleland and Bull).—The growth is a cellular one, though the number of cells varies much in different parts. Thus we may find a strand of tissue with closely packed cells with nuclei parallel to each other, and beside this a strand almost devoid of nuclei and composed of indefinite fibrils. These cellular strands may perhaps be considered as showing the same type of arrangement as is met

with in the "rosettes" of some gliomata, only on a large scale. The nuclei of the tumor cells are oval or sometimes more spindle-shaped. The cell outlines are indistinct, and tend to merge into a fibrillar matrix. Well-developed capillaries and occasional thin-walled larger vascular channels are present. The growth is gliomatous.

(5) FIBRO-SARCOMA INVOLVING THE LEFT TEMPORO-SPHENOIDAL LOBE.

(*Under the care of Dr. W. Ray, Honorary Physician. Notes by Dr. E. F. Gartrell.*)

.R. W., an hotel ostler, *æt.* 59, was admitted to the Ophthalmic Ward on May 25th, 1922. He was dull mentally, and unable to give any history of his illness. Examination revealed weakness and spasticity of the right hand and leg. Babinski's sign was present on both sides. He had a senile cataract in both eyes, and a view of the fundi was unobtainable. On May 28th he became unconscious, and had involuntary evacuations of the bowels and urine.

On May 30th he was transferred to the physician (Dr. Ray) with spasticity more on the right side than on the left. The following day there was a right-sided facial paralysis. He carried his arms across his chest owing to spastic contractions of the flexor muscles. His tendon jerks were more active on the left side. Babinski's sign was still present on both sides. The superficial abdominal reflex was present on the left side, but absent on the right. Subsequently he suffered from retention and overflow, and was catheterised. A fortnight later he seemed to have less mental obscuration, but his general condition was not much altered. He became progressively weaker, and finally, on July 21st, became pulseless and died. His temperature, pulse, and respiration remained normal throughout his illness, except for a terminal rise of temperature to 101° F.

The *post-mortem* examination (No. 92/22) revealed a glioma of the left temporo-sphenoidal lobe. After hardening in formalin, its localisation was undertaken by Dr. T. Grant, with the following result:—A mass 7 cm. long, 5.5 cm. in greatest width, and about 6 cm. in depth, occupied the centre of the left temporal lobe, extended to the surface of this lobe, where it was adherent to the dura mater, and invaded the subjacent white matter. Anteriorly the mass was easily separable from the brain substance of the temporal pole, but in the deeper parts this feature was lost, and infiltration was seen. The mass did not extend into the parietal lobe.

Microscopical Appearances (Drs. Cleland and Bull).—Sections show in places the structure of a fibro-sarcoma. The cells are numerous, the nuclei are elongated, sometimes markedly so, and there is a distinct tendency to a whorled appearance. The cells are separated by well-defined delicate connective tissue fibrils (stained by the fuchsin in van Gieson's method). The vessels are well marked and usually show well-developed walls. Occasional small areas of necrosis appear in the cellular parts. In addition, in the deeper parts large areas of fibrin infiltration and others of leucocytic infiltration are present. Plasma cells are not seen. The surrounding brain substance shows some large reactionary glial cells. The growth may have commenced in the pia mater or the dura mater (which were adherent to the growth) or from the fibrous tissue in the wall of a vessel in the brain itself.

(6) FRONTAL ABSCESS FOLLOWING AN OLD SHRAPNEL WOUND OF THE HEAD.

(Under the care of Dr. F. R. Hone, Honorary Physician, and Dr. A. M. Cudmore, Honorary Surgeon. Notes by Drs. W. A. Fleming and G. F. Gartrell.)

W. M., a laborer, *æt.* 35, was admitted under the care of Dr. Hone on August 22nd, 1922, complaining of headache. The patient denied any venereal infection, but had had a shrapnel wound in the forehead whilst at the war. His headache had commenced three days before admission, and he had had to cease work at 5 p.m. on the 21st, and in the evening had become irrational and restless. When examined after admission, his face was flushed and moist. He was semi-comatose, and lying in a position of general flexion. The pupils reacted to light and accommodation, and the optic discs were clearly defined and normal in color. The tongue was thickly coated and the breath foul. There was a scar just to the left of the midline of the forehead, extending from the orbital margin into the hairy area for 1in. A circular area of the cicatrix was pulsating and tender on pressure. The bone surrounding this hernia cerebri was also tender. The heart and lungs showed no abnormality. The reflexes were normal. Kernig's sign was elicited on both sides. The limbs were spastic, and he objected to any extension. Tâche cerebrale was marked. The urine was retained, and a catheter specimen revealed no abnormality. The temperature was 103° and the pulse 100. By lumbar puncture 30 c.c. of purulent fluid, under increased pressure, was withdrawn. This contained many pus cells, but no micro-organisms. It gave a negative Wassermann test, as did also the blood. The leucocytes numbered 18,000 per cubic millimetre. The blood culture was negative. On the 23rd two lumbar punctures were carried out, and purulent fluid was again obtained. There was no optic neuritis. Over the hernia cerebri superficial inflammation was evident. He became more irrational and restless, and his reflexes became more feeble. He was then transferred to the surgeon.

On August 20th, under ether anæsthesia, an incision was made along the line of the scar. From the upper limit of the incision a horizontal cut was made outwards. The flap was dissected downwards and outwards. An area 1½in. in diameter in the skull was found to be replaced by scar tissue. This scar tissue was incised in a horizontal direction, and pus was found. A small slit was made in the skin, corresponding with this incision through the scar, and the wound was then closed with interrupted sutures. His temperature rose to 106° immediately after operation, and he died, without regaining consciousness, the same day.

The autopsy showed a scar adherent to the dura mater and the brain. Below the scar was a large frontal abscess, communicating with the lateral ventricle of that side.

(7) CEREBELLAR ABSCESS FOLLOWING A SEPTIC FINGER.

(Under the care of Dr. John Corbin, Honorary Surgeon. and Dr. Angas Johnson, Honorary Physician. Notes by Dr. C. Finlayson.)

P. S., a male, *æt.* 36, a laborer, was admitted to a surgical ward on August 12th, 1922. He complained of a whitlow on the middle finger of his right hand. Ten days previously his

finger had become blistered as a result of wood-chopping, and infection followed. He complained also of pain present for some days in his left ear. His bowels were constipated, he had lost his appetite, and felt "off color." Previously his general health had been good. On examination he was a fairly well-nourished man, very apathetic, and difficult to rouse. He answered questions rationally, but very slowly. The temperature was 96°, pulse 64, and respirations 20. The tongue was dry, with a thick brown fur on the dorsun. An examination of the heart, lungs, and abdomen revealed nothing of interest. The pupils were dilated, the right slightly larger than the left, and reacted to light and accommodation. The superficial abdominal reflexes were not elicited; otherwise nothing abnormal was found in the nervous system. Examination of the left tympanic membrane showed slight injection but no discharge, and no sign of recent scarring. There was no tenderness over the mastoid region. The urine was normal. An examination of the cerebro-spinal fluid showed nothing abnormal. The leucocytes numbered 4,000 per c.mm. During the next two weeks the finger healed, but the patient remained very lethargic, and crebration was slow. The bowels were obstinately constipated. No further signs developed, and he was transferred to a medical ward.

Examination of the nervous system on August 29th showed dilated pupils which reacted sluggishly to light. The left was slightly irregular and smaller than the right. Nystagmus, more noticeable on looking to the right, was present. Diplopia occurred on looking downwards and to the right. The cranial nerves otherwise showed no involvement. On the motor side there was no loss of power. The deep reflexes were much increased. There was no sensory impairment. There was inco-ordination of the upper and lower limbs and vertigo on attempting to stand. The patient was unable to walk, so that his gait could not be observed. There was no Kernig's sign and no neck rigidity. Examination of the fundi showed congestion of the left optic disc. The leucocytes now numbered 15,000 per c.mm., of which polymorphonuclear cells comprised 60%, the lymphocytes 33%, the large mononuclears 2.5%, and the eosinophiles 2.5%. The Wassermann reaction was negative in the blood and cerebro-spinal fluid on two occasions. His condition remained much the same until a few days before his death, when he complained of headache, and vomiting of a cerebral type occurred. He died on September 29th.

The *post-mortem* examination showed thickening of the meninges, flattening of the convolutions, and an increase of fluid in the ventricles. An abscess containing greenish pus was present in the right lateral cerebellar hemisphere. This contained numerous staphylococci.

(8) PLASMA-CELL MYELOMA OF THE SECOND CERVICAL VERTEBRA CAUSING COMPRESSION OF THE SPINAL CORD.

(Under the care of Dr. de Crespigny, Honorary Physician, and Dr. Cudmore, Honorary Surgeon. Notes by Dr. D. L. Barlow.)

W. B., a widower, by occupation a carpenter, had been ill for seven months. At the onset he experienced a sensation of something giving way in the neck during coughing. A little later he had severe pain in the upper part of the back of the neck on moving the head, and in a few days' time the pain extended into the right side of the neck down to the collar-

bone. The left side of the neck became similarly affected one month later, but the right side was always the more affected. After some weeks he began to have pain in the head, which was most severe in the forehead and occipital region. The pain appeared to travel up from the right side of the neck, and was accompanied by a burning pain. About the beginning of January, 1921, attacks of shivering occurred, commencing in the arms and upper part of the trunk, and then extending to the toes. The attacks would last a few minutes, but were not accompanied by any unusual sensations. There had been no vomiting. The eyesight was not disturbed. For two months both hands had felt stiff, and the sensation in his hands had become somewhat impaired. The head was large and of peculiar shape, with a central longitudinal ridge. The neck looked large and felt rigid. There was tenderness over the upper three or four cervical spines, and the movements in this region were restricted. There was weakness of both hands and arms, and œdema over the dorsum of the right hand, as well as wasting of the interossei and the muscles of the thenar and hypothenar eminences. The pupils were irregular in outline, but otherwise normal. No paralyses of cranial nerves could be demonstrated. There was an extensive area of hyperæsthesia involving the back of the neck down to the upper dorsal region, and extending over the top of the head (but not involving the forehead), and about half-way around the sides of the neck. There was an area of great hyperæsthesia involving the central part of the anterior aspect of the neck in the upper cervical area. The sensation in the limbs was normal. The Wassermann reaction of the cerebro-spinal fluid was negative, there was a positive globulin reaction, and a few red cells and lymphocytes were present. There was slight weakness of both legs. The left knee jerk was more active than the right. Double Babinski was present. The patient was unable to void urine.

Improvement took place for about 10 weeks, by which time he could walk with assistance, and all his pain had disappeared. He left hospital, but was readmitted on June 14th, 1921, complaining that he was worse. He had difficulty now in getting his hand to his mouth, and the legs had commenced twitching again. The pain had become throbbing in character. An operation was now performed, and the upper part of the cervical cord exposed by a laminectomy. A somewhat soft tumor was found growing from the body of the second cervical vertebra and pressing backwards on the cord. A small piece was removed for microscopic examination. Dr. Bull reported that the growth was probably a myeloma (of the plasma-cell type). The patient gradually became weaker, and died on July 7th, 1921. At the autopsy the second cervical vertebral body was found to contain a large soft growth, involving most of the interior of the body, and also forming a rounded projection into the vertebral canal, causing compression of the cord.

Microscopical Appearances (Drs. Cleland and Bull).—Sections show a neoplasm composed of masses of cells very like plasma cells, with the same type of excentric nucleus, but the cells are larger than the generality of plasma cells. A very delicate fibrous stroma supports the cell masses. The microscopic appearance is similar to that presented by sections of multiple myeloma of plasma-cell type, of which we possess an example.

Comment.—This case and the next to be described present microscopical appearances suggestive of multiple myeloma. Both

tumors, and a third that has since come under our notice, pressed on the spinal cord, the pressure symptoms leading to operative procedures and the discovery of the growths. In each case the growth was apparently single.

(9) PLASMA-CELL MYELOMA PRESSING ON THE SPINAL CORD.

(*Under the care of Dr. de Crespigny, Honorary Physician, and Dr. Cudmore, Honorary Surgeon. Notes by Dr. W. Gilfillan.*)

H. W., male, *æt.* 20, single, a clerk, was admitted to the Adelaide Hospital on August 1st, 1922. Six months previous to admission he had felt severe pains in the back and in the "pit of his stomach." These pains continued for about four weeks, but did not increase in severity, and then gradually disappeared. At the same time he noticed a weakness in his legs, which continued until eight weeks after the onset of the backache, when he noticed his knees began to give way under him, and he could only stagger along, and finally was unable to walk at all. At this stage his legs would get stiff and involuntarily flex up on his abdomen when they were touched. Feeling in his legs also disappeared, but he was unable to state the time. Only on one occasion did he have trouble in voiding his urine. He has control over his excreta. There was no headache now and no vomiting. He had had a "poisoned" leg 12 months previously, but no other illness. There was no history of venereal disease.

When examined after admission, the patient was lying on his back in no distress. The examination of the chest, abdominal organs and the eyes revealed no abnormality, and the upper extremities were normal. The lower limbs were fully extended, and on grasping them a "mass" reflex occurred, in which the whole leg flexed on the abdomen. The lifting of either leg off the bed produced a clonus. The knee jerks were exaggerated on both sides, and there was a double knee and double ankle clonus. The Babinski sign was present in both limbs. The abdominal muscles were flaccid, and only weak voluntary contractions were elicited. There was a complete loss of epicritic, protopathic, and thermal sensations extending up to a well-defined area 2in. above the umbilicus. No zone of hyperæsthesia was detected. The urine had a specific gravity of 1022, and was acid in reaction, and no albumin was present. A lumbar puncture was performed, the fluid running very slowly, so that only 2 c.c. were obtained in a quarter of an hour. It was blood-stained, probably from trauma by the trocar, and consequently showed many red cells, but no lymphocytes or micro-organisms were detected. It reduced Fehling's solution. The Wassermann reaction was negative. There were 12,000 leucocytes per c.mm. in the blood, with the following differential percentages:—Polymorphonuclears 60%, lymphocytes 23.56%, large mononuclears 9.5%, and eosinophiles 7%. A radiograph of the spine revealed no abnormality.

On August 4th, 1922, under ether anæsthesia, laminectomy was performed. A hard extradural tumor was found, extending from the sixth to the eighth dorsal vertebra, and cutting off the circulation of the cerebro-spinal fluid below this level. The tumor mass extended into the adjacent vertebræ, and infiltrated them. A portion of the extradural tumor was excised, and the section revealed the histological characters of a myeloma with a large number of polymorphonuclear cells. On August 17th, 1922, the wound had healed. The patient had now

no control of his sphincters. Otherwise the physical condition was unchanged. On September 12th, 1922, his condition was still unchanged, and he left the hospital, against medical advice.

Microscopical Appearances (Dr. Bull).—Sections show a fairly dense fibrous stroma, in parts extensively infiltrated by plasma-like cells and round cells, sometimes collected into narrow bands or cords, sometimes occurring in large cellular masses fairly well circumscribed, sometimes more diffusely infiltrating. The large masses are apt to degenerate and show œdematous infiltration and polymorphonuclear invasion. In the cellular areas are found chiefly typical plasma cells or round cells approaching these, with occasional eosinophile cells and fine capillaries pass between the cells. The larger vessels in the stroma show marked endarteritic proliferation. Capillary hæmorrhages are present in places. The medulla of a lamella of one of the vertebræ shows proliferation of the cellular elements and the presence of cells like plasma cells.

Comment.—The microscopical features of this growth seem identical with those met with in multiple myelomata. Albumosuria was, however, apparently not present, and the growth was single. An alternative possibility is that the growth is an unusual granulomatous reaction, due to the presence of an infective agent. The *Spirochæta pallida* suggests itself (the vessels showed endarteritis). The Wassermann reaction in the cerebro-spinal fluid was negative, which is some evidence perhaps against this view—the test was not done on the blood. We consider that the growth is closely related to, if not identical with, the plasma-cell myeloma.

(10) ANGIOMA OF THE PIA MATER OPPOSITE THE CAUDA EQUINA.

(*Under the care of Dr. de Crespigny, Honorary Physician, and Dr. Cudmore, Honorary Surgeon. Notes by Drs. Fleming and Gartrell.*)

J. W., a male clerk, *æt.* 18, was admitted on August 7th, 1922, complaining of loss of power in the right foot. He had previously suffered from diphtheria and measles when a child, and in later life had had pneumonia and pleurisy, and also "fluid on the knee." Three and a half years before admission he fell off a bicycle, but did not notice any immediate ill effects. Six months later, however, he noticed that whenever he started to run he would trip. This defect slowly increased till the time of admission. He had had no pain or alteration in sensation in the legs, but had had pain in the right hip joint and the bottom of the spine. He had been "costive" for six months. He had not lost weight. He was a somewhat pallid man. The temperature was normal, and the pulse rate was 96. The pupils reacted to light and accommodation. The heart, lungs, and abdominal organs were apparently healthy. At the level of the third and fourth dorsal spines there was some lateral deviation, but no abnormal projection and no tenderness. The right leg was somewhat bluish in color and perspired more than the left. Some periarticular thickening was felt around the right knee joint, which contained some fluid. The movements of the right knee and hip were equal to those on the left side. The knee jerks, which were hyperactive, were equal on both sides. An ankle clonus was obtained on both sides, but it was stronger on the right. There was an ulcer on the big toe of the right foot where a corn had been cut. Measurement showed the circumference of the right calf to be ½in. less than that of the

left, while the measurement of the right thigh and knee was 1in. greater than that of the left. Sensation was unimpaired. He walked with foot-drop on the right side. He was unable to dorsi-flex the foot at the ankle owing to paralysis of the tibialis anticus and almost complete paralysis of the long extensors of the toes. Rectal examination elicited no tumor mass. By lumbar puncture the cerebro-spinal fluid was found under increased pressure. It gave a positive ammon. sulph. reaction, and contained 342 lymphocytes per c.mm. No micro-organisms were detected, and the Wassermann test, as also in the case of the blood, gave a negative result. X-ray examination showed no pathological changes in the vertebral column. The fields of vision were approximately equal and normal. Although the fundi and discs appeared a little pale, nothing pathological was discovered by ophthalmoscopic examination. The electrical reactions were as follows:—The peroneal nerve reacted in all muscles except the tibialis anticus. The tibialis anticus reacted neither to faradism nor galvanism. The extensores digitorum and hallucis longi, and also the peroneal muscles, reacted to faradism. A tumor, affecting the conus medullaris and cauda equina on the right side, was diagnosed. The patient was treated by massage, and discharged at his own risk on August 21st.

On September 28th he was readmitted to a surgical ward, and it was decided to explore the region of the cauda equina. Next day, under ether anæsthesia, a vertical incision, extending from the tenth dorsal vertebra to the fifth lumbar vertebra, was made in the middle line. The incision was deepened until the spines and interspinous ligaments were located. The sacrospinales and other muscles were then detached from the vertebræ so as to expose the whole of the spines and corresponding laminæ. Bleeding was effectively controlled by tampons and pressure. The laminæ of the twelfth dorsal and first and second lumbar vertebræ were then removed with large bone-cutting forceps, and the dura mater exposed. As no obvious abnormality could be detected, the laminæ of the eleventh dorsal and third lumbar vertebræ were also removed. It was then decided to incise the dura longitudinally. An incision was made about 2in. in length. Much cerebro-spinal fluid was lost, but with no untoward result. A large tortuous vein was detected, intermingled with nerve roots of the cauda equina, and apparently in the pia mater, and exit vessels were noted. The pathological condition was considered to be an angioma. No attempt was made to remove the vein; it was impossible to ligate above and below it. The wound was finally brought together with deep silkworm stitches, the dura mater remaining open in order to relieve pressure on the contents of the canal. The patient made an uninterrupted recovery from the operation. The movement of the right leg improved slightly. On October 29th, 1922, the left ankle clonus was diminished, but his condition was otherwise the same.

(11) TABES DORSALIS WITH MULTIPLE CHARCOT'S JOINTS.

(Under the care of Dr. Ray, Honorary Physician. Notes by Dr. R. Griffiths.)

A. R., female, *æt.* 58, was admitted to the hospital on April 4th, 1922. Her illness had commenced two months before admission—while walking, her left leg "gave way" under her, causing her to fall. Following this she was in bed for a month

with pain in and swelling of the left knee. Subsequently her right knee behaved in a similar fashion. Whilst she was in bed following this incident, both ankles became swollen three days before admission. The patient's general health was excellent. The past history was negative, except that she had had "rheumatic pains" in the limbs for about eight years. The pains were described as being stabbing in character, very severe, and of momentary duration (lightning pains). The patient had been married, but had had no children and no miscarriages. Her husband died when aged 57 from a growth "in the bowels." She had had no difficulty in walking prior to the commencement of the present illness. She did not feel giddy, and could walk quite as well in the dark as in daylight. The patient had no girdle pains and no feelings of numbness in the extremities.

On examination the patient was a rather stout woman, in no evident distress. The temperature, pulse rate, and respiratory rate were normal. The pupils were equal and reacted very sluggishly to light, but more actively to accommodation. The heart presented no abnormality; a few rales were presented at the bases of both lungs posteriorly. Both knees were swollen, the right knee more so than the left. They were neither red nor hot to the touch. Both knee joints contained a moderate amount of fluid. Both could be moved freely, but there was crepitus without pain. Both ankles were slightly swollen, and gave the signs of the presence of fluid in the synovial cavities. The knee and ankle jerks were not elicited. No sensation of pain was caused by pinching the tendo Achillis. Cutaneous localisation and the position sense seemed to be normal. The Wassermann reaction in the blood serum was negative on May 16th. On May 25th the patient was passing fæces into her bed, due to lack of sphincter control. On June 1st radiographic examination showed "a degree of hypertrophic arthritis with loss of articular cartilage in the right knee joint."

On June 14th lumbar puncture was performed, and clear fluid obtained. The fluid showed excess of globulin and a moderate lymphocytosis. The Wassermann reaction in the cerebro-spinal fluid was positive.

On May 19th treatment by means of intravenous injections of novarsenobenzol (billon) was commenced. Two injections were given weekly, starting with 0.45 grms. In all, 6.75 grms. were administered.

By June 22nd the pains had disappeared, and there was definitely less fluid in the joints. On July 6th the patient commenced to walk with the aid of sticks, and on August 29th was discharged. On that date she was walking fairly well, had no pain, and there was very little swelling of the joints. Radiographic examination showed the condition of the bones and cartilages to be not appreciably altered.

(12) CHARCOT'S DISEASE OF THE LEFT KNEE-JOINT TREATED BY EXCISION.

(Under the care of Dr. John Corbin, Honorary Surgeon. Notes by Dr. C. Finlayson.)

T. E., male, *æt.* 42, clerk, was admitted to hospital on May 25th, 1922. He complained of painless swelling of the left knee-joint present for the past eight months. The swelling and disability had steadily increased, so that his limb had become practically useless. There was a history of gonorrhœa in 1918.

On examination, the pupils were irregular, the right did not

react to light and the left reacted sluggishly. The teeth were fairly good, and the tongue clean. The heart and lungs showed no abnormality. The knee jerks were absent. Rhomberg's sign was present. The urine was normal. The left knee-joint showed heat, swelling, deformity, and signs of fluid. There were hypertrophic bony changes. The patella was greatly increased in size, as was also the upper end of the tibia, which was displaced backwards and inwards. Limitation of movement was pronounced, and there was grating on attempting to move the joint. The Wassermann reaction was positive for the blood. On June 8th Dr. Corbin excised the joint, removing thickened gelatinous synovial membrane, pieces of loose cartilage, the crucial ligaments, the semilunar cartilages, and the articular surfaces of the femur, tibia, and patella. The bony ends were brought into accurate apposition by means of wire, a slight degree of flexion being maintained. The limb was put on a long back splint with side Cline splints. On July 5th the leg was put up in plaster of Paris, and the patient discharged on July 11th on crutches. Some months later the limb showed ¾in. shortening, and the patient was walking securely with the aid of a stick.

IV.—MEDICAL CASES.

(1) POLYCYTHÆMIA VERA.

(*Under the care of Dr. Hone, Honorary Physician. Notes by Dr. W. R. Tonkin.*)

C. L., male, *æt.* 23, was admitted to the Adelaide Hospital on February 23rd, 1922, complaining of pain in the right side of the abdomen. The first attack had occurred 18 months previously, and since then he had had 18 such attacks. The pain was of the renal colic type, and lately had become very severe, lasting up to 1½ hours. Hæmaturia had been present for the past six days. This had preceded the last attack. He felt a dull, aching pain in the right loin, which was always present. He had lost nearly 2st. in weight during the last 2½ years.

On observing the patient, one was immediately struck by the bluish-red flush over both cheeks. There was a left subconjunctival hæmorrhage, which appeared after a blow on the eye several days before. The right lumbar region was tender on palpation. The spleen could just be felt. The urine contained much blood and albumin, but no organisms. No other facts were elicited. At first a diagnosis was made of renal calculus, but X-ray examination revealed nothing abnormal, so further investigations were made. It was noticed that the subconjunctival hæmorrhage did not clear up, and this, together with the bluish-red color of the cheeks, led to a complete blood examination being made. This showed the presence of 9,000,000 red cells and 5,500 leucocytes per c.mm. The differential count was normal. The color index was .5. X-ray examination of the thorax revealed a normal heart shadow. To reduce the number of red cells, benzol (3 grains) was given three times a day. The hæmaturia, albuminuria, and subconjunctival hæmorrhage rapidly cleared up, and at the end of 10 days the red count was 6,000,000. The patient, who now was quite free from pain, was sent home, with a supply of benzol, and ordered to report in two months. Unfortunately, he has not as yet (December) reported. A diagnosis of Polycythæmia Vera was made. No vasomotor instability was observed, and the spleen was only slightly enlarged. This enlargement disappeared after the benzol treatment.

(2) ACUTE NEPHRITIS FOLLOWING LOBAR PNEUMONIA AND PERITONSILLAR ABSCESS, ONSET WITH A CONVULSIVE ATTACK.

(Under the care of Dr. de Crespigny, Honorary Physician. Notes by Dr. C. Turner, Medical Superintendent.)

R. G., male, *æt.* 29, occupied as a painter, and residing at Norwood. He had had a "cold" for one week prior to admission, and had been taken suddenly ill the evening before. He had fallen down, and complained of headache and shortness of breath and pain and tightness across the chest. There was a slight cough, with some bloodstained sputum. He had had "influenza" three years previously, and was ill for three months. He had had frequent attacks of quinsy for several years. He was a well-nourished man, in good physical condition, and when examined after admission his temperature was 102.4° F., the pulse rate was 114 per minute, and his respirations 42 per minute. He had pyorrhœa alveolaris, and his tongue was furred.

Examination of the chest revealed no cardiac or pulmonary abnormality. His urine was free from albumin. Two days later there was a consolidation at the right base posteriorly, and the left lung posteriorly was congested. A small quantity of turbid fluid was removed from the right pleural cavity four days after admission, and it contained many cells, mostly lymphocytes, but no organisms by smear examination. There were 29,000 leucocytes per cubic millimetre at this time. The subsequent course for two weeks was that of a frank lobar pneumonia. The small amount of fluid was gradually absorbed from the right pleural cavity, the temperature subsided by crisis on the sixth day, and he was convalescent. Twenty-one days after admission he complained of a sore throat. There was pyrexia and the appearances of a peritonsillar abscess on the left side, with enlargement and tenderness of the corresponding lymph glands. This condition subsided in four days. At this time he was sleeping very poorly, and complained of headache, and three days later he had a general convulsive attack with cyanosis and unconsciousness. Examination showed some œdema of the ankles, with slight lumbar œdema. There was no enlargement of the heart and no bruits. The systolic blood pressure was 155 millimetres, and the diastolic 110. Microscopic examination of the urine showed that it contained some blood casts and numerous leucocytes. Two days after the first convulsion he had a second similar one. His treatment for seven days consisted of dieting with barley water, and milk and water, with a daily purge of jalap, and four vapor baths. His general condition rapidly improved, so that at the end of a week after the onset of the nephritis he felt well, and was without headache or œdema. His progress afterwards was one of gradual and progressive improvement, and he was discharged 55 days after admission, or 33 days after the onset of the nephritis. The following tables give a resumé of the findings and progress:—

SUMMARIES.

Day of illness.

1. Onset of pneumonia.
7. Crisis.
21. Onset of tonsillitis.
28. Convulsive attack.
30. Second convulsive attack.

55. Discharged with urine free from albumin. Systolic blood pressure 120 mm., diastolic blood pressure 95 m.m. Urine gave a positive chemical reaction for blood.

76. Fair cloud of albumin. No blood in urine. Feels well.

Day of illness	Sp. Gr.	24 hours Ttal C.C.	Albumin (Grams in 24 hours).	R.B.C.	W.B.C.	Casts.	Blood Urea. Mgms. per 100 C.C	Urine Urea. Gms. per 100 C.C.	Urine Na. Cl. Gms. per 100 C.C.
29	..	..	..	..	..	..	18	..	..
36	1020	..	..	++	+	Blood	..	..	..
37	1020	1080	Heavy 4·3	..	..	Blood	..	..	..
38	1020	1140	3·4	..	..	..	..	..	..
39	1008	870	·45	—	+	..	15	·74	·89
40	1008	1050	·75	..	..	..	..	..	..
41	1010	3000	..	..	..	..	..	..	..
42	1008	2100	1·6	..	..	..	..	..	..
43	1006	2340	..	+	+	Hyaline	..	..	..
44	1010	2700	4.05	..	..	..	..	..	..
45	1008	1800	..	..	..	..	18	..	..
46	1008	1860	1·8	+	+	—	..	..	·91
47	1010	2700	..	..	..	..	..	..	..
48	1001	1800	..	..	..	..	..	..	..
49	1020	1800	1·8	..	..	..	..	..	..
50	1020	1680	..	..	..	..	15	..	..
51	1020	1250	·6	..	..	..	..	..	..
52	1020	1500	..	..	..	..	15	..	..
53	1020	1320	1·3	..	..	..	..	..	..
54	1020	1500	..	..	..	..	..	..	..
55	1020	960	·9	..	..	..	..	..	..
56	1020	1440	..	..	..	..	..	..	..
57	1020	1200	..	..	..	..	..	..	..
58	1020	2100	1·1	..	..	..	..	..	..
59	1015	1800	..	..	..	..	..	..	..
60	1020	1350	1·3	..	..	..	..	..	..
61	1015	1800	..	..	..	..	..	..	..
62	1020	1800	·4	..	..	..	..	..	..
63	1020	1200	..	..	..	..	..	..	..
64	1020	1500	·7	+	+	—	..	1·5	·92
65	1020	2100	..	..	..	..	..	..	..
66	1018	1680	·8	..	..	..	..	..	..
67	1020	1440	..	..	..	..	..	..	..
68	1020	1680	..	..	..	..	..	..	..
69	1020	1200	1·2	..	..	..	..	..	..
70	1010	1500	..	..	..	..	..	..	..
71	1015	1440	..	..	..	..	..	..	..
80	..	..	..	+	++	Granular (few)	1·5	..	·5
92	1018	..	+	+	++	Granular (few)	..	..	..

W.B.C. = leucocytes, R.B.C. = red corpuscles, + = few, ++ = many.

(3) DIABETES ASSOCIATED WITH PANCREATIC CALCULUS AND CHRONIC PANCREATITIS.

(Under the care of Dr. S. R. Burston, Honorary Assistant Physician. Reported by Dr. D. L. Barlow, Honorary Clinical Pathologist.)

A. R., male, *æt.* 58, stated that he had suffered from diabetes for three years. He had had treatment, but had steadily lost weight. He had first noticed that he was passing an increased amount of urine, then that his thirst was much increased and that he felt hungry, in spite of taking great quantities of food. There had been vague abdominal pains and malaise. He had lived in the tropics for 13 years, and there suffered from cholera and dysentery. On admission to hospital he appeared thin, but his right leg was œdematous. There were signs of cardiac failure, including œdema at the pulmonary bases. The urine contained 5% of sugar and considerable di-acetic acid and acetone. He died seven days after admission to hospital.

At the autopsy, is addition to a dilated heart and hypostatic pneumonia, a very much altered pancreas was found. It was extremely hard in consistence, unusually adherent to its surroundings, and somewhat smaller than normal. On section a large, irregular, white calculus was found close to the junction of the pancreatic and common bile ducts. Throughout the body and tail of the organ the ducts were enormously dilated, the main duct being 1 cm. in diameter, with a large sacculation containing the calculus. On section the pancreatic tissue everywhere appeared to be almost replaced by fibrous tissue. Microscopically only very small remnants of glandular tissue were seen. Unfortunately these had undergone *post-mortem* degeneration, and it was thus impossible to be sure whether or not they represented Langerhan's islets.

V.—SURGICAL CASES.

(1) PENETRATION OF THE ANUS BY A PITCH-FORK HANDLE, WITH TRAUMATIC DIAPHRAGMATIC HERNIA.

(Under the care of Dr. M. Scott.)

C. S., a lad, *æt.* 17, when descending from a haystack, 7ft. high, slipped and fell on to the handle of a pitch-fork. The end of the handle entered the anus, passed through the rectum, injured the abdominal contents, and finally perforated the diaphragm. The patient complained of severe abdominal pains immediately after the injury, and one-third of a grain of morphia was administered hypodermically by the doctor who saw him soon after the accident. He was admitted to the hospital about four hours after the accident. He did not appear to be very distressed. The temperature was 98°, the pulse rate was 120 per minute, and his respirations 30 per minute. The abdomen was generally tender and rigid, and there was dullness in the left flank and in the hypogastrium. The urine, drawn off by catheter, was clear and contained no blood. There was some perianal ecchymosis, and the anus was considerably dilated and lax. Five and a half hours after the accident the abdomen was opened by a median sub-umbilical incision under ether anæsthesia. There was a considerable quantity of blood in the peritoneal cavity and a series of lacerations of the abdominal

viscera. The blood was removed with sponges, bleeding points ligatured, and the peritoneal laceration sutured. There was an injury to the rectum which was inaccessible for repair through the abdomen, and this was approached through a retro-anal incision and a drainage tube inserted. The patient died the following day.

The following is a detailed account of the injuries found at autopsy, prepared by Dr. Barlow (No. 11/22):—On opening the thorax there was an escape of gas from the left side, and the lung was found to be partially collapsed. Almost the whole of the stomach was herniated through a hole in the left cupola of the diaphragm. The hole occurred in the tendinous portion, and was, approximately, 2½in. x 1½in. in extent, leaving ragged edges. A large hole in the mesentery opposite about the middle of the small intestine had been sutured, as also had a rupture in the peritoneum on the left lateral aspect of the true pelvis. The rectum had a large ragged tear on its anterior wall. The anal region had served as a funnel to direct the handle into the orifice, and the handle had then ruptured the anterior wall of the upper part of the rectum, travelling thence upwards extraperitoneally, rupturing the peritoneum on the left wall of the pelvis, and subsequently traversing the mesentery and diaphragm.

(2) ECTOPIA VESICÆ IN AN ELDERLY FEMALE PATIENT.

(*Under the care of Dr. de Crespigny, Honorary Physician. Notes by Dr. T. Nihill.*)

This case is reported in view of the great age (68 years) attained by a patient laboring throughout life under such a disability. The patient, who died of heart failure, had complete ectopia vesicæ, the pubic bones being separated by a gap of more than 3in. In this gap the bladder mucosa was exposed, with the ureters opening on its surface about 2½in. apart. The right ureter was dilated to nearly 1cm. in diameter, except in its terminal portion, which was narrowed. The corresponding pelvis was dilated and contained pus. The renal parenchyma was narrowed to less than half the normal amount, and showed septic changes with numerous purulent foci. The left ureter was normal, but the kidney was somewhat fibrotic, and about half the normal size.

(3) A CASE OF AUTO-CASTRATION.

(*Under the care of Dr. A. M. Cudmore, Honorary Surgeon. Notes by Dr. W. A. Fleming.*)

F. W., male, *æt.* 45, was admitted to the Adelaide Hospital on September 15th, 1922, and was discharged on October 18th, 1922. One month previous to admission the patient had knocked his scrotum. It became swollen after the injury, but the swelling quickly subsided, leaving a painful right testicle. This pain at last became so intense that the patient felt he could no longer tolerate it. Four days previous to admission he consequently incised the right scrotum with a razor, removed the testicle, and closed the wound with black cotton. Examination showed a large hæmatoma involving the right scrotum, and a partially closed, but apparently clean, wound. The clot was expelled through the incision and the whole scrotum fomented. No attempt was made to remove the cotton stitches until the seventh

day. No testicle could be found. Although the cavity discharged serous fluid for some time, it gradually lessened its capacity, partly because of the decrease in size of the scrotum, and partly by attempts at repair. When discharged, the wound had almost ceased to discharge. At no time during the treatment did the patient show any pyrexia. The patient was of normal mentality, had a knowledge of first aid, and had castrated animals. He made no comment as to the pain during the operation.

(4) ANEURYSM OF THE SUBCLAVIAN ARTERY; LIGATION; SUBSEQUENT RUPTURE AND DEATH.

(Under the care of Dr. Cudmore, Honorary Surgeon. Notes by Dr. W. A. Fleming and Dr. D. L. Barlow.)

H. C., male, *æt.* 75, was admitted on June 27th, 1922, complaining of a lump in the left infraclavicular region. It had been first noticed about nine months earlier, when it felt about the size of a marble. It had gradually increased in size, giving rise to pain in the forearm and in the little and ring fingers. Latterly he had been unable to sleep owing to the pain. Examination showed a swelling about the size of a billiard ball in the left infraclavicular region. Pulsation was visible, and its expansile nature could be detected on palpation. The tumor was well defined and smooth, and most prominent at a point corresponding with the junction of the sternal and clavicular heads of the pectoralis major. Ascultation revealed a systolic murmur. No history of syphilis was obtained. There was some thickening of the radial vessels. Blood pressure 150. Under a general anæsthetic a transverse incision was made above the clavicle. The third part of the subclavian artery was found and ligated. Some pulsation could be felt in the tumor beyond, subsequent to the operation, although it had decreased in size. The patient was discharged on July 17th.

He was again admitted on September 25th, 1922. He said that the swelling had begun to enlarge again about 10 days previously. It was now much larger than ever, the pulsation seemed much greater, and the shooting pain in the left arm was intense. Examination showed the swelling to be about 3½in. in diameter. It was pulsating vigorously, and a thrill could be detected above the clavicle on palpation. Pressure above the clavicle diminished the pulsation. Oedema of the arm was present. On September 24th, about 8.30 a.m., the patient complained of sudden intense pain in the region of the swelling, and examination showed the axillary fossa to be distended and tense. The pulsation had decreased to some extent; the pectoralis major was pushed forward. The patient was obviously suffering from shock. An immediate operation was performed, the transverse incision made at the previous operation being reopened and a large suprascapular artery found. Obliteration of its lumen did not decrease the pulsation. A U-shaped incision was then made below the clavicle, the pectoralis major was separated from the clavicle, and the pectoralis minor cut transversely. The aneurism was freed as much as possible. Free blood was present in the fossa, and a rent found in the lower part of the sac. The subclavian artery was ligated from below the clavicle, the aneurism opened, and the clot removed. Small vessels entering the sac were ligated. The incision was then closed. The patient's condition was low on leaving the theatre and he died at 3.30 p.m. on the same day.

At the autopsy, the aorta was found to show the appearances typical of a syphilitic aortitis, namely, infiltrated patches and scars causing extreme puckering. The subclavian artery showed a fairly deep groove from the first ligature, but the latter had become loose and slipped. The sac of a large aneurism was present, affecting the axillary artery, and its inner surface was roughened, and in places had on it deposits of laminated clot. The other main branches of the aorta were similarly diseased.

VI.—NEOPLASMS.

(1) AN UNUSUAL TYPE OF SQUAMOUS EPITHELIOMA OF THE PALATE.

(*By Dr. H. M. Jay, Honorary Aural Surgeon.*)

A. G., a male, *æt.* 54, was admitted to the Out-Patients' Department on August 5th, 1922. He complained of a sore mouth and throat, the first symptoms having been noticed about seven months prior to admission. The patient was a heavy drinker and smoker. His father had died of cancer of the mouth. On examination, the teeth were found to be carious, and he had pyorrhœa, whilst the tonsils were "flabby" and congested. There was a small ulcer on the inner aspect of the left lower alveolar margin. On the right side of the soft palate were two raised patches about the size of a split pea. The condition was considered to be syphilitic, but on two occasions the Wassermann reaction was negative. He gave a positive von Pirquet test. The process slowly extended to the right anterior faucial pillar, and the raised patches became surrounded by an inflammatory area, and bled easily. A portion was removed for examination, as the process appeared likely to prove tuberculous. Dr. Bull reported that the specimen was probably epitheliomatous, but requested a larger piece for examination. A subsequent examination of a larger specimen showed the diagnosis to be correct, and the patient was handed over to Dr. Newland, who was able to remove the whole of the affected area. At the time of operation the patches on the anterior pillar had practically disappeared, leaving a faint scarring, and thus simulating the lupoid process of healing and spreading. At no time was there any ulceration, and the growth involved the buccal aspect of the palate only. There was no glandular involvement.

Comment.—This case is of interest. on account of the unusual type of growth, which appeared at first sight more like a tuberculous or syphilitic process.

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(2) CARCINOMA OF THE PYLORUS IN A BOY AGED EIGHTEEN YEARS.

(*Under the care of Dr. Newland, Honorary Surgeon, Notes by Dr. C. Finlayson and Dr. D. L. Barlow, Honorary Clinical Pathologist.*)

J. B., a male, farm laborer, *æt.* 18, was admitted to hospital on July 7th, 1922. His present illness had commenced eight weeks before with vomiting after his mid-day meal. Pain was associated with the vomiting and relieved by it. The pain was sometimes severe in character and constantly situated in the

mid-epigastric region. Loss of weight had been very great in the last few months. Jaundice became evident five weeks before admission, and had remained constant. Hæmaturia had occurred in the last three weeks. Almost pure blood and numerous clots were passed, associated with pain, felt chiefly at the end of micturition. Oedema of the left leg appeared four days before admission. He gave a history of occasional attacks of biliousness and indigestion, associated with acid eructations during the past 12 months. Otherwise his health had been good. We are indebted to Dr. H. K. Pavy, the patient's private medical attendant, for much of the above information.

On examination, the patient was an emaciated, deeply jaundiced boy, lying in bed in a good deal of pain. Examination of the eyes, teeth tongue and chest was negative. The abdomen was distended, pulsation was present in the epigastrium, dilated veins crossed the abdominal wall, and signs of free fluid were present. Nodules were palpable between the umbilicus and the xiphoid process. The liver was one finger's breadth below the costal margin in the mid-clavicular line. It was not enlarged upwards. The urine was alkaline, the specific gravity 1030, and pus, blood, albumin, and bile were present. The stools were clay colored. Two days after admission vomiting commenced, projectile in character. Pain was complained of behind the left ear and in the neck. Hæmaturia was constant. Weakness increased, and death occurred on July 21st.

Post-mortem Examination (No. 90/22).—The pyloric region of the stomach was found to be infiltrated by a growth for a distance of, approximately, 2in. from the ring, especially in its lower half. The inner aspect showed irregular, softish elevations. There was extensive malignant invasion of the gastro-hepatic omentum, the peritoneal covering of the transverse colon and the parietal peritoneum, giving rise to thickened plaques. The omentum was infiltrated and matted together into a mass about 3in. long. The large bile ducts were constricted by carcinomatous deposits. The peritoneum covering the urinary bladder was infiltrated with a carcinomatous deposit, which extended laterally into the left common iliac vein. An ante-mortem thrombus was present there, extending as far as the inferior vena cava. The liver showed greatly distended bile ducts, but there was no carcinomatous deposit in it. The lungs showed consolidation posteriorly. The other organs showed nothing of note. Microscopically the primary growth and secondary deposits had the usual structure of a columnar-celled carcinoma.

(3) CARCINOMA OF THE BREAST, WITH MULTIPLE SECONDARIES AND HÆMOPOIETIC REACTION.

(Under the care of Dr. Angas Johnson, Honorary Physician. Notes by Dr. C. Finlayson.)

E. T., female, *æt.* 42, single, was admitted to hospital on September 28th, 1922, complaining of pain in the back and in the legs, especially the right thigh and hip. General weakness had increased greatly during the last few months. She had been told that she had "fibrositis." She gave a history of having had carcinoma of the breast. The right breast had been removed 14 years before. Nodules recurred in the scar five years after this operation. She had had X-ray treatment. In July, 1921, the left breast was removed, and a section of the tumor was reported on as carcinomatous.

On examination, the patient was a middle-aged woman, not emaciated, but of a lemon-yellow color. The chest wall showed the scars of former operations, with muscular thickening in the right pectoral region. The abdomen was protuberant, signs of free fluid being present. X-ray examination showed advanced secondary carcinoma, involving both hip joints, the pubic bones, and lumbar and dorsal vertebræ, with partial collapse of several vertebral bodies. Examination of the blood showed:—Red cells 1,500,000 per c.mm.; hæmoglobin, 25%; color index, .83; and white cells, 18,000. Differential count:—Polymorphonuclears, 27%; lymphocytes, 70%; large mononuclears, 1%; transitional cells, 1%; eosinophiles, 1%. The film showed anisocytosis, poikilocytosis, megaloblasts, normoblasts, and myelocytes. The blood picture was of interest in that it closely resembled that of pernicious anæmia, but with a low color index. The patient became very dyspnoeic, and died after a blood transfusion on October 5th. The *post-mortem* examination showed secondary carcinomatous deposits in the spine, omentum, and liver. The uterus contained numerous subperitoneal fibroids. A partial examination only was permitted, so that the long bones could not be sectioned.

(4) AN UNUSUAL NEOPLASM (MALIGNANT MELANOMA *SINE MELANIN*) OF THE SKIN OF THE BACK, FOLLOWED BY GENERAL DISSEMINATION.

(*Under the care of Dr. Newland, Honorary Surgeon. Notes by Dr. L. B. Bull, Deputy Director of the Laboratory, and Dr. Barlow, Honorary Clinical Pathologist.*)

The patient, R. B., a male, *æt.* 62, was admitted to the hospital on September 20th, 1921, complaining of a lump on the right side of the back (loin) and lumps in the left groin. About a year earlier he had noticed a small nodule beneath the skin of the left loin. This had gradually increased in size, and two months before the above date broke down, and discharged for about two weeks. It subsequently became covered by a scab. The lump was at first freely movable, but latterly had become fixed. It had always felt hard, but only caused slight pain. The lumps in the groin were noticed about three months before admission to hospital, and had gradually increased in size.

On examination he was found to have an ulcer about 1½in. in diameter close to the mid-line in the left lumbar region. The surface was sloughy and the edges raised, enclosing a crater-like cavity. There was considerable surrounding induration, but the lump could be moved over the deeper structures. A band of rather indurated tissue was traceable from the main mass in an outward and downward direction. The oblique group of inguinal glands on the same side were enlarged and hard. There was little tenderness in the loins or glands. Bacteriological examination of the ulcer resulted in the cultivation of *Staphylococcus albus*. The Wassermann reaction was negative. A portion of the edge of the ulcer was excised and examined microscopically. The section showed a granulomatous reaction, but no definite evidence of any neoplastic development. On October 6th the ulcerated area, together with all the indurated tissue and overlying skin, was removed. The enlarged glands in the groin, together with the overlying skin and surrounding tissues, were also excised *en bloc*. The wounds healed rapidly, and the patient was discharged.

In April, 1922, he was readmitted, suffering from intestinal obstruction, and a colotomy was performed. At the operation he was found to have masses of much enlarged retro-peritoneal glands, and the bowel had apparently become kinked over these. There were several enlarged glands in the left groin and hard nodules in the overlying skin. On the left side of the neck was a chain of enlarged glands. One of the latter was removed, and microscopic examination showed a deposit of a neoplasm resembling an endothelioma. Gradually other groups of glands became involved, and numerous nodules appeared in the skin and subcutaneous tissues of the hypo-gastric region.

The autopsy findings were as follows:—There were numerous hard, raised, dark nodules scattered in the skin and subcutaneous tissues of the lower part of the abdomen and upper parts of the thighs, especially on the left side. The whole of the skin in these areas felt indurated. There were numerous enlarged hard glands on both sides of the neck, and a hard mass in the position of the thyroid gland. The glands in the axillæ and groins were also much enlarged. On dissection it was found that all these glands were pale yellowish from invasion by a malignant growth. The thyroid gland was almost replaced by a malignant infiltration. The mediastinal glands were greatly enlarged by malignant deposits, and the peribronchial glands formed large malignant masses, extending outward into the lungs. The lungs also contained some separate small deposits. The heart had two subpericardial flattened deposits, the larger anteriorly along the course of the anterior coronary vessels. The liver was large, tough, and congested, and contained only a minute deposit. The gall bladder had a small buttonlike deposit on its under aspect. Almost all the intra-abdominal lymphatic glands were greatly enlarged from malignant deposits, forming large masses along the brim of the pelvis and vertebral column.

Histopathology.—The primary tumor consists mainly of necrotic tissue with tumor cells confined to the deeper edge and the more superficial periphery, although very sparse in the latter situation. The tumor cell is round or irregularly polygonal. It tends to grow diffusely, following the lines of least resistance and filling up all the lymph spaces. New blood vessels are formed in close association with the tumor cells. There is little stroma formation, and the tumor cells do not tend to group in alveolar fashion. The tumor cell resembles most the polygonal cell of a melanoma of the skin, although search for melanin fails to reveal any. It is not possible to offer a dogmatic opinion as to the nature of the tumor cell, but the opinion is held that the tumor is a malignant skin melanoma, *sine melanin.*

Comment.—This case is of considerable interest and importance from a diagnostic and prognostic point of view. Three histological opinions have been successively held during its study. The first of these was palpably wrong, but can be excused by extenuating circumstances. A biopsy was made of a portion of the primary ulcer. Unfortunately this portion consisted mostly of necrotic tissue with a secondary inflammatory reaction. The malignant cells present were almost completely hidden in consequence, as is the original writing in a palimpsest. They were not recognised. Masses of cocci, probably the *Staphyloccus albus* grown in cultures, were present in the dead tissue. They were believed to be the responsible agents for the condition, which was thought to be of the nature of equine

botryomycosis. The inflammatory reaction seen around was doubtless due to this secondary infection. Later the view was entertained that the new growth was endotheliomatous. Fuller re-examination did not support this view, vacuolisation and canalisation of the cells not being seen, and their definite association with vascular channels not being established. On the other hand, the appearance of the cells and their arrangement, even though no melanin was detected, suggested those of a malignant melanoma, with which the site of the primary lesion in or immediately subjacent to the skin was easily reconcilable. The large indurated crateriform ulcer, though unusual, is not inexplicable on this diagnosis. The involvement of the inguinal glands would be a natural sequence, and following on this the dissemination in further draining glands. More deposits than one would have been expected in the liver, however. The site (in the loin) is an unusual one for any malignant growth, though we have seen a huge rodent ulcer in this situation.

(5) AN INOPERABLE RENAL TUMOR OF UNUSUAL HISTOPATHOLOGY.

(*Under the care of Dr. Simpson Newland, Honorary Surgeon. Notes by Dr. C. Finlayson.*)

A. D., female, *æt.* 21, married, was admitted to hospital on June 16th, 1922. She complained of pain in the upper part of the abdomen on the left side, and of a dragging sensation, due to a large tumor occupying the left side of the abdomen. The tumor had been noticed for the past 12 weeks. The pain had commenced two days before admission, being severe in character and continuous, and not referred elsewhere. There had been no vomiting. The bowels had been regular. There had been no frequency of micturition, and she had never passed large quantities, and had not associated the passage of urine with a reduction in size of the tumor. She had had a difficult labor six weeks previously.

On examination, the patient was a young woman, thin and pale, with a temperature of 99° F., pulse 120, and respirations 28. The abdomen was asymmetrical, the left side being protuberant and irregular in contour. The wall moved well with respiration. A tumor could be felt. Its anterior margin extended to the right of the midline, and sloped from above, downwards and outwards from the costal margin to the level of the anterior superior iliac spines. Irregular notches and semicystic areas could be felt. It was dull on percussion. The dullness extended from the anterior margin to the midline posteriorly, and above was continuous with the liver dulness. A band of resonance crossing the tumor was not demonstrated. The upper area subjacent to the costal margin was definitely tender. The urine was pale, acid, of specific gravity 1020, with no albumin and no sugar. A vaginal examination was negative. The leucocytes numbered 7,000, consisting of polymorphonuclears 67.5%, lymphocytes 30.2%, eosinophiles .25%, basophiles .25%, and large mononuclears 1.5%. The red cells numbered 3,480,000 per c.mm., hæmoglobin 72%, color index .93. On June 19th an exploratory operation was performed. An incision was made in the loin. The renal capsule traversed by large veins presented. On opening the capsule the grey vascular jelly-like material of a new growth was found. A section was taken. The patient was discharged on July 2nd.

Histopathology (Dr. Bull).—The tumor cells are arranged in masses forming an irregular network. They are small and closely packed, and are not unlike rodent ulcer cells in size and arrangement. They are separated by a relatively large amount of loose vascular stroma showing a tendency to a myxomatous appearance. In places the tumor cells and stroma cells seem to be imperfectly differentiated. In some of the tumor masses are numerous small, spherical bodies, stained with hæmatoxylin, but showing lighter portions, the stained part appearing sometimes as a ring or at the poles. These may be seen on the protoplasm of cells in which the nucleus is indefinite, sometimes grouped in fours. The spherules may slightly infiltrate the stroma. They probably represent a degenerative change in the protoplasm of the tumor cells. Near one mass of tumor cells, an indefinite tubule with an imperfect lumen was seen. The vessels are confined to the stroma, and are often extremely thin-walled, and may be formed of elongated stroma cells apparently without endothelial lining. Others have thicker walls shawing a hyaline change. The tumor is probably an unusual form of malignant "mixed tumor," differing from a typical Wilms' tumor in the absence of tubular structures. It is possible that it represents a carcinoma that has developed from a papillary growth of the renal pelvis.

(6) A CASE OF MULTIPLE RENAL ADENOMATA.

(*By Professor J. B. Cleland and Dr. D. L. Barlow.*)

The patient, a male, *æt.* 55, was admitted to hospital on account of shortness of breath and so-called asthma of two months' duration. He had suffered from a cough, with watery expectoration, in which no tubercle bacilli could be found. He died after a fortnight's stay in the hospital.

At the autopsy, generalised old adhesions were found between the lungs and parietes, and both organs were in a state of partial collapse. The right lung showed a considerable area of almost complete consolidation, with a tendency to carnification. The left lower lobe was in a state of grey lepatisation, with the exception of small areas of air-containing lung. The heart showed no valvular lesions, but the left ventricle was dilated and hypertrophied. The kidneys showed a coarsely granular surface after removing the rather adherent capsules. The cortex on each side was rather contracted and fibrous in appearance. Both kidneys were studded with numerous pale, rounded adenomatous nodules from the size of a pin's head to that of a pea. These occurred especially just beneath the capsule. In addition, one kidney contained a soft, whitish, pear-shaped nodule, about ¾in. in diameter, and with its apex towards the pelvis, and a more irregular area with whitish contents of about the same size. The other kidney showed on its convex surface two projecting growths, one of a pale yellowish trabecular appearance and of the size of a small marble, the other cystic and hæmorrhagic, with trabeculae and clot, the size of a large marble. Microscopically, the kidneys showed arterio-sclerotic changes with areas of fibrosis, often wedge-shaped, containing in places collections of round cells. The tubules in between the fibrosed areas were often dilated. The cortex showed scattered adenomatous areas of varying structure. These areas were separated from the kidney tissue proper

by a slight imperfect capsule, traversed in places by adenomatous tubules. Some of these areas were microscopic in size. One of the large cysts showed a definite papillomatous appearance, having a wall of low columnar cells and a cavity filled with numerous processes capped with low columnar epithelium. Slight hæmorrhage had occurred into this adenoma, and its wall was thicker and less infiltrated than the other adenomata. The renal tubules immediately beyond its capsule showed a heaping up of epithelium with the formation of folds, and the cells showed a darker staining than usual. These appearances suggested the extension of the adenomatous process to adjoining parts. Another smaller cyst showed wide tubules with thin walls, the latter tending to break down. A third type of adenoma showed closely packed tubules peripherally, and in the centre the tubular structure tended to be lost and to be replaced by a solid arrangement. Several other small areas in the sections examined showed appearances suggestive of the commencement of this adenomatous development, namely, darkly staining, active looking cells or collections of small tubules closely packed together.

Comment.—Areas of compensatory hyperplasia are not uncommon in kidneys showing chronic interstitial changes. Here such hyperplasia appears to have proceeded further with the development eventually of circumscribed adenomatous-looking nodules of somewhat varying histology. A feature in this case was the large number of these nodules.

VII.—EYE DISEASES.

(1) HERPES OPHTHALMICA.

(*Under the care of Dr. Hill, Honorary Ophthalmic Surgeon. Notes by Dr. E. F. Gartrell.*)

C. W., *æt.* 69, a plasterer, was admitted on February 21st, 1922. Eight days previously the patient had had severe pain over the right side of the forehead and in the right eye. Two days later a rash appeared over the right side of the forehead and nose. This consisted first of red spots and later of little blisters which broke. The right eye became red and sore, and vision became impaired.

On examination, a right unilateral pustular eruption was present on the forehead, extending back to the vertex and extending down to the side of the nose and on to the eyelids. The ocular conjunctiva was very red and protuberant with great œdema. There was a white discharge under both eyelids. Both conjunctival and ciliary injection were present. The iris was hazy and the crypts were ill-defined. The pupil was irregular at the margins and did not dilate well. Foments were applied to the affected area and atropine was used to dilate the pupil. Hst. arsenicalis hydrochlor. was administered. On February 23rd the skin condition was improving. Some signs of third nerve paralysis were present. The patient was irrational and restless, and had to be put in straps. Hyoscine was given. On February 25th three small spots were seen on the lower part of the cornea. These were then covered with the membrane from a fresh egg. The pupil was not dilating well. The ulceration of the cornea proceeded and the surface looked black,

probably owing to the argyrol. The third nerve paralysis persisted. Anæsthesia developed on the area previously covered by the rash. Attacks of neuralgia also occurred in this area, necessitating the administration of pyramidon. The patient now received subcutaneous injections of aqua marina. On April 4th he was discharged with a corneal opacity in the lower part, while some ciliary injection persisted.

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