CENTRAL NERVOUS SYSTEM

MAIN CATALOGUE

CASE 889
No clinical information is available.
The specimen is of a bisected eye. There is a 15mm diameter mass arising from the region of the ciliary body that protrudes into the vitreous humour. The mass has a well-defined margin and appears dark in colour.
Diagnosis: Malignant melanoma of the ciliary body
What symptoms might such lesions cause during life? Visual disturbance due to retinal detachment, intraocular haemorrhage or secondary glaucoma; symptoms related to metastatic disease.

CASE 1058
The patient was a man aged 52 years who had suffered from severe mental retardation and had been in residential care for many years. He died from acute pulmonary oedema.
The specimen consists of the entire brain which is much smaller than normal, particularly the cerebral hemispheres. The gyral pattern is normal and the basal arteries, apart from their small calibre, show no abnormality. The most striking abnormality is the small size of the brain, considering the age of the patient.
Diagnosis: Microcephaly

CASE 1067
No clinical details are available.
The specimen consists of a transverse section through the cerebellum and brainstem. Most of the right cerebellar hemisphere is replaced by a spherical cystic cavity, measuring 45mm in diameter that extends across the midline to involve the left hemisphere to a lesser extent. The lining of the cyst is smooth and its wall measures up to 2mm in thickness in places.
Diagnosis: Cerebellar cyst, possibly astrocytoma
Comment: A particular type of astrocytoma frequently occurring in the cerebellum, particularly in children, is typically cystic (pilocytic astrocytoma).
What symptoms might the patient have complained of during life?
With a lesion in the right cerebellar hemisphere, one would expect:

- changes in muscle tone, reflexes and incoordination of voluntary movements on the right
- unsteadiness of gait, with a tendency to stagger to the right
- dysarthria - slurring of speech due to poor motor control of articulation
- nystagmus, with fast beats to the right

CASE 1770
A 12 year old boy had a several week history of increasingly severe headaches, typically worse in the mornings and associated with nausea.
What do the boy's symptoms suggest? Raised intra-cranial pressure.
On examination he had severe bilateral papilloedema. An operation was performed but was unsuccessful and the child died a few days later.
The specimen consists of a coronal slice of the cerebral hemispheres and brain stem viewed from behind. There is a lesion measuring 30 x 20mm situated at the posterior end of the third ventricle, just below the corpus callosum and which is indenting the midbrain. The lesion has well defined margins and a variegated tan to grey appearance. Focally it appears slightly friable. The lateral ventricles appear of normal size.
Diagnosis and comment: The lesion is obviously a tumour. The differential diagnosis of tumours in this region of the pineal gland is germ cell tumour, astrocytoma, ependymoma, metastatic carcinoma (unlikely at this age) and pineal cell tumours. This one histologically was reported as a pinealoma.

CASE 2586

A 22-year old man had been in good health until 3 weeks before admission when he began to develop headache and vomiting. These became gradually worse and he then developed drowsiness and a high temperature. On examination he was found to be confused and disoriented with a temperature of 104°F (40°C). There was neck stiffness and papilloedema. A lumbar puncture was performed and the CSF contained many lymphocytes, occasional polymorphs and low chloride and glucose levels. The patient's condition gradually worsened and he died 11 days after admission.

The specimen consists of the lower half of the brain that has been cut transversely. There is extensive exudate within the meninges, which appear opaque, on the base of the brain that obscures the circle of Willis, optic chiasm and several cranial nerves. The cerebral gyri are flattened.

Diagnosis: Tuberculous meningitis

What features suggest that this is tuberculous meningitis rather than viral or suppurative bacterial meningitis? The clinical history is more prolonged than one would expect with a suppurative bacterial meningitis; viral meningitis is generally milder, patients don't have raised intracranial pressure, the CSF glucose level is not low and one sees little meningeal exudate; the CSF contains lymphocytes (one would expect neutrophils to predominate in a suppurative meningitis) and in TB meningitis the exudate is typically most severe around the base of the brain, as here.

What other organs would you be interested in examining at post mortem? The lungs - to look for evidence of pulmonary TB.

CASE 4278

The patient was a man aged 47 who died in 1941.

The specimen consists of the right part of the brain cut in the sagittal plane. A rounded well-circumscribed mass approximately 30mm in diameter is present in the hypothalamic region. Its cut surface shows a papillary architecture. There is no definite evidence of haemorrhage or necrosis. The lateral ventricle is slightly dilated, suggesting that there might have been obstruction.

Diagnosis and comment: Students should be able to ascertain that neoplasia seems the most likely aetiology, however, this is not a specimen on which undergraduates would be expected to make a more precise diagnosis on the basis of the macroscopic features. The site (above the pituitary fossa) is typical of craniopharyngioma and this diagnosis was reportedly confirmed on histological examination. The papillary architecture is not typical, only being found in a proportion of cases in adults. Other tumours of this region include pituitary adenomas (upward extension of), meningioma, gliomas in the hypothalamus and metastases.

CASE 4315

A 50-year old chartered accountant was admitted to hospital because of severe personality changes. Over the past 2 years he had become childish, uninterested in his surroundings and dirty in his personal habits. Examination showed severe disorientation and blunting of affect. During his one year in hospital he gradually deteriorated and died after a meal during which he stuffed rubbish and a quartz pebble in his mouth.

The specimen consists of the right half of the brain that has been cut sagittally and the arachnoid and subarachnoid vessels have been removed. There is marked atrophy of the gyri in the frontal and temporal regions, which are separated from each other by deep sulci. This is most obvious on the medial aspect of the specimen. The brain stem and cerebellum appear normal.

Diagnosis: Fronto-temporal atrophy

Comment: Definitive diagnosis of the cause of any dementia requires histology and in this case the diagnosis of Pick disease was made. Compare the appearance of the frontal and temporal gyri in this specimen with those in specimen 4278, which has been cut in the same plane.

CASE 4363
The patient was a 20-year old man with a history of right external strabismus since aged 7 and paroxysmal attacks of headache, diplopia, tremor and right-sided weakness for a number of years. He also had a tendency to go to sleep during meals. During the last few months he had became incontinent, developed akinetic mutism and then bilateral pyramidal signs (right>left). He underwent ventriculography that showed dilation of both lateral ventricles and non-filling of the third ventricle. Following the ventriculogram he became febrile, comatose and died after 5 days.
The specimen shows the lower half of the cerebral hemispheres. Extending into both hemispheres from the region of the third ventricle is a spongy mass consisting almost entirely of thin-walled vessels that involves the thalami and posterior aspects of the internal capsules bilaterally. There is no evidence of acute haemorrhage or thrombosis.
Diagnosis: Arteriovenous malformation

CASE 4369
A 14 year old schoolboy had a 12 month history of uncontrollable bouts of temper and epileptic seizures. In the last 2 weeks before admission he complained of headache, photophobia, neck stiffness and breathlessness. On examination he had a pulse rate of 60, slurred speech, bilateral papilloedema, unequal pupils and gross lateral nystagmus. There was severe ataxia and both planter reflexes were extensor. Lumbar puncture showed increased pressure only. He died in respiratory failure 4 days after admission.
The specimen consists of the superior half of the cerebellum that has been cut horizontally and is viewed from beneath. There is a 5cm tan mass in the midline completely replacing medial structures and invading the dentate nuclei bilaterally. The margins of the lesion are well demarcated. There is focal haemorrhage.
Diagnosis and comment: Histology confirmed the diagnosis of medulloblastoma that can be suggested from the age of the patient and location of the tumour.

CASE 4418
A 4 year old girl had been in good health until 2 weeks before admission when she began to stagger and became unable to walk without assistance. It had also been noticed that the child's cough "didn't sound natural". On examination the child was irritable, she had unequal pupils (right larger than left), absent abdominal reflexes, exaggerated tendon reflexes, and a bilateral extensor plantar response. The fundi were reported as normal. The CSF was under increased pressure but otherwise normal. Skull x-ray showed only slight widening of the suture lines. During the week after admission the patient developed bilateral 6th nerve palsies. On the 8th day she suddenly stopped breathing after having vomited. She was placed in a respirator, but was pronounced dead 3 hours later.
The specimen consists of a coronal slice of the cerebral hemispheres through the brain stem and a transverse section through the pons and cerebellum. The main abnormality within the cerebral hemispheres is the dilatation of the lateral ventricles and compression of sulci. The pons is expanded by a lesion 3cm in diameter within the left dorsal region. The lesion is variegated in appearance with a light brown to grey colour. The margins are very poorly defined. There is no haemorrhage or necrosis in the lesion or brainstem. The lesion extends over the midline and has completely compressed the 4th ventricle. The cerebellar tonsils cannot be assessed due to flattening of the specimen and the section is not optimal for assessing transtentorial herniation.
Diagnosis: Astrocytoma (confirmed histologically) of pons
How do the changes seen in the two tissue specimens relate to each other? The dilatation of the lateral ventricles is related to obstruction of normal CSF flow where the tumour has compressed the 4th ventricle. Compression of the sulci results from displacement of subarachnoid CSF as the intracranial pressure rises.
What is the likely cause of the patient's death? From the clinical information given, the mode of death could well be respiratory arrest due to cerebellar tonsillar herniation.

CASE 4729
No clinical details are available.
The specimen consists of a bisected eye. One half of the globe is filled by a variegated tan and brown mass measuring 20 x 10mm. The margins appear well defined but the mass has infiltrated through the sclera onto the surface of the globe.
Diagnosis: Choroidal malignant melanoma
What symptoms might the patient have had during life? Visual disturbance due to retinal detachment, intraocular haemorrhage or secondary glaucoma; symptoms related to metastatic disease.

CASE 6087
A 58-year old retired barrister had been in good health until a year before admission when he became increasingly confused and was, at times, quite irrational, although this did not prevent him from speculating on the Stock Exchange and making an enormous profit. He had a positive Wasserman test. He refused treatment and was readmitted 1 year later in a comatose state with a left hemiparesis and died 2 days later.
The specimen shows both halves of the brain that has been cut horizontally (look at the back of the pot!). On the superolateral surface (on the back) the meninges are white and opaque. There is also some gyral atrophy. The cut surface shows cortical atrophy especially in the frontal lobes.
Diagnosis and comment: The meninges appear thickened suggesting some form of inflammation, but the history is not of acute meningitis. A chronic meningitis such as tuberculous meningitis is possible, but the history is still a bit long and it wouldn't explain the atrophy. This is in fact general paralysis of the insane, a manifestation of tertiary syphilis. General paralysis of the insane results from the organism *Treponema pallidum* invading brain and causing a chronic encephalitis, especially in the frontal cortex, as well as causing meningeal inflammation and fibrosis. Histologically, there is a perivascular and meningeal chronic inflammatory reaction with meningeal fibrosis and atrophy of the cortical parenchyma and spirochetes can sometimes be identified. There is often associated ventricular dilatation and the ependyma has a fine ground-glass appearance due to granular ependymitis. Clinically, as in this case, there is progressive deterioration in mental and physical function with mood alterations, often with delusions of grandeur.

CASE 6177
The patient was a 66-year old man who had to leave work about 5 months before admission because "he could no longer remember orders". At the same time he had noticed weakness, unsteady gait, giddiness and a tendency to fall over. The symptoms had increased in severity and for the past 3 months he had suffered from nocturnal incontinence of urine. Examination showed slight ataxia, poor muscle tone, slight nystagmus and an absent left biceps jerk. Lumbar puncture showed a low CSF pressure (80mm water), and a normal rise on jugular compression but a slow fall. The cellular content of the CSF was normal but there was a very much raised protein content. Skull x-ray was normal. The patient developed bronchopneumonia and died 2 weeks after admission.
The specimen consists of the left half of the brain. Arising in the region of the obex is a variegated grey and tan tumour, roughly 3cm in diameter. It compresses, rather than invades, adjacent structures, pushing the cerebellar nodule and uvula upwards and the medulla forwards. The third and fourth ventricles are not dilated and the rest of the brain appears normal.
Diagnosis and comment: This is obviously a neoplastic lesion. Sections reportedly showed a vascular tumour consisting of pleomorphic and mitotically active ependymal cells (i.e. ependymoma) that did not show papillary arrangements or form glandular spaces. There was sharp demarcation between the tumour and the cerebellum.

CASE 6299

A 15-year old boy developed a cold 12 days before admission. It was sufficiently severe for him to be confined to bed for a week. Three days before admission there was fever, headache and vomiting. On admission he was found to have neck stiffness and a temperature of 37.5°C (103°F). Both pulse and respirations were rapid and there was evidence of bulbar palsy with pooling of secretions in the pharynx and palatal deviation. A lumbar puncture showed 43 cells/μL, mostly neutrophils. A tracheostomy was performed and the boy was placed in a respirator, but he became increasingly irrational and died 9 days after admission. At post-mortem there was bronchopneumonia.

The specimen is a horizontal slice through the cerebral hemispheres. Both hemispheres are symmetrically swollen and the cavities of the lateral ventricles are compressed. There are scattered petechial haemorrhages in the white matter, most evident in the internal capsules, the corpus callosum and the occipital lobes.

Diagnosis and comment: The macroscopic features of this specimen are those of cerebral oedema and are thus non-specific. In this case, the clinical history is the main aid to making a specific diagnosis. This is an old specimen and the patient was a child who developed paralysis requiring ventilation, 12 days after a 'flu like illness……it's polio (confirmed histologically).

CASE 6718

The patient was an aboriginal from Alice Springs. No other details are available.

The specimen consists of a coronal slice of the cerebellum cut obliquely so that anteriorly the right hemisphere appears enlarged while posteriorly the left cerebellar hemisphere appears bigger than the right. Within the right hand side of the pot, there are 4 lesions within the cerebellar parenchyma. They are all well defined, with wavy (serpiginous) margins. They range in diameter from 2 to 15 mm. They are made up of concentric layers, including white caseous foci and are surrounded by a rim of grey tissue. The rest of the cerebellum appears normal.

Diagnosis: Tuberculoma of the cerebellum. A reasonable differential diagnosis would be suppurative abscesses.

CASE 6863

A 64-year old man had been in good health until 6 months before his death when he was admitted to hospital because of sudden onset of confusion with vomiting and incontinence. The CSF at that time had been xanthochromic with a raised protein content and a diagnosis of sub-arachnoid haemorrhage was considered. However, the patient made a spontaneous recovery and no treatment was given.

Four months later he began to develop progressive leg weakness and 5 days before admission he again became confused and increasingly comatose.

Examination showed hypertension and coma with diminution of the left knee jerk and left ankle clonus. The CSF showed only increased pressure and a raised protein content. The coma gradually deepened and he died a few days after admission.

What is clonus? What is its significance?

Clonus refers to the rapid, strong oscillating muscular contractions that occur when sustained tension is placed on one of the muscles around a joint such as a wrist or ankle. Although a few beats may be normal in an infant, the presence of clonus usually indicates a lack of the normal cortical inhibition of a deep tendon reflex.

The specimen consists of a coronal slice of the cerebral hemispheres seen from the front. The left lateral ventricle has been almost completely obliterated by a lesion that invades brain but which has relatively well-demarcated margins and extends across the midline to the right lateral ventricle. The lesion has a variegated appearance, ranging from pale cream to haemorrhagic with areas of necrosis. On the posterior aspect of the specimen the tumour can be seen invading the septum pellucidum, displacing it to the right, and projecting into the ventricular floor.

Diagnosis and comment: This lesion was histologically reported as ependymoma. The differential diagnosis includes glioblastoma. Other tumours occurring in the lateral ventricle include meningioma, choroid plexus papilloma and metastatic carcinoma.

CASE 7611

The patient was a 69-year old woman who had had a radical mastectomy for carcinoma 2 years earlier. Since then she had become progressively weaker and lost much weight. There had also been transient neurological symptoms and signs (tremor, unsteady gait, hallucinations) that were attributed to cerebral metastases. On examination the only significant neurological signs were a lower motor neurone left facial palsy, left nystagmus and generalised tremor. She rapidly deteriorated and died 6 days after admission.
The specimen shows a thin slice of pons and cerebellum, sectioned at the level of the middle cerebellar peduncle. The 4th ventricle has been completely obliterated by a slightly variegated, yellowish, round, well-circumscribed mass 15mm in diameter that does not appear to invade brain tissue. There is no obvious haemorrhage or necrosis.
Diagnosis and comment: A diagnosis of metastatic breast carcinoma is tempting in view of the past history, but the macroscopic appearance is not characteristic: it is only a single lesion and it appears very well circumscribed, which suggests a benign lesion. Histology was required for definitive diagnosis, which was tuberculoma. At autopsy there were also white nodules in the upper lobes of both lungs and adrenals.
What histological features would suggest TB? The presence of necrotising granulomatous inflammation: necrosis with associated epithelioid macrophages, giant cells and many lymphocytes.

CASE 7677

A 12-year old boy had a 5 day history of malaise, tiredness, nausea and vomiting. For 2 days before admission he had been hiccoughing almost continuously. On examination the patient had a temperature of 37°C, with marked neck and back stiffness and frequent bouts of hiccoughing. There were no localising neurological signs. Lumbar puncture showed normal pressure, a protein content of 0.06g/L (0.15-0.45 g/L), 91 red cells, 31 lymphocytes and 11 polymorphs per μL. The CSF chloride was 680mmol/L (118-132mmol/L) and the glucose 3.3mmol/L (2.8-4.2mmol/L). A repeat lumbar puncture showed 7000 red cells per μL, xanthochromia and a chloride of 725mmol/L.
During his stay in hospital the patient remained drowsy and irritable and developed frequent periods of apnoea. At first he recovered spontaneously from these attacks, but 2 weeks after admission he died during one of them.
The specimen consists of cerebellum and adjacent brainstem, comprising pons and upper medulla. Within the medulla is a well-defined circular lesion, 20 mm in diameter, surrounded by a rim of normal tissue. The lesion has a dark brown colour throughout with only scattered slightly paler areas. There is no evidence of haemorrhage elsewhere.
Diagnosis: Intramedullary haemorrhage
Comment: At post-mortem the cervical spinal cord was much enlarged and showed a central cystic cavity with surrounding areas of degeneration and gliosis. These changes extended downwards as far as the upper thoracic cord where they ended abruptly. There is a well-recognised association between haemorrhage into the grey matter of the spinal cord and medulla (haematomyelia) and cavity formation in these organs (syringomyelia, syringobulbia).

CASE 8709

The patient was a woman aged 41 years at the time of her death. Until aged 24 she had been of normal intelligence and had held a responsible position, but then she developed increasing spasticity of all limbs with flexor contractures and became permanently bedridden. Over the last few years of her life she became quite demented, developed epileptiform convulsions and led a vegetative existence. She died of bronchopneumonia.

The specimen is a transverse slice through the cerebral hemispheres. There is marked atrophy of both hemispheres and the ventricular cavities are greatly dilated (*hydrocephalus ex vacuo*). On the reverse of the specimen ill-defined grey lesions are present in the white matter of the occipital lobes behind the posterior horns of the lateral ventricles. Similar but less obvious changes can just be made out in the white matter of the frontal lobes lateral to the anterior horns of the ventricles.
Diagnosis: The macroscopic appearance in association with the clinical history lead to the diagnosis of advanced chronic multiple sclerosis.

CASE 8744
The patient was a man aged 64 with multiple myeloma.
The specimen consists of 13cm of spinal cord covered by dura. On the external surface of the dura there are multiple irregular nodular lesions that are matted together. They range in colour from pale to dark brown.
Diagnosis: Extradural metastatic deposits
Comment: Histology reportedly showed masses of atypical plasma cells.

CASE 8779
The patient was a man aged 62 who suffered an anterior dislocation of C4.
On examination both plantar responses were extensor. The abdominal reflexes were absent and there was flaccid paralysis of all four limbs. The pupils were contracted but reacted sluggishly to light. He died on the 2nd day.
The specimen shows 17cm of spinal cord. Towards the upper portion of the cord is a vertical laceration 35 x 5mm with little tissue reaction or haemorrhage.
Diagnosis: Traumatic spinal cord injury

CASE 8943
The patient was a woman aged 26 who was admitted to hospital with a massive subarachnoid haemorrhage in January 1954 and died 3 days later.
The specimen comprises a coronal slice through the hemispheres and brain stem, with a separate segment of spinal cord. Within the cerebral hemispheres is a large ill-defined lesion present in the region of the right corpus striatum. On closer inspection this has a somewhat spongy appearance and appears to be composed of abnormal vessels within the brain parenchyma. A markedly dilated right internal cerebral vein runs deep to the lateral wall of the lateral ventricle. This shows thrombotic occlusion on the posterior aspect of the specimen. A second dilated vein about 1cm in diameter runs horizontally in the sagittal plane at the base of the septum pellucidum. Abnormal vessels are also present in the subarachnoid space within the Sylvian fissure and above the midbrain. Acute subarachnoid bleeding is visible in the sulci on the right side of the brain and over the surface of the spinal cord.
Diagnosis: Arteriovenous malformation with subarachnoid haemorrhage

CASE 8965
The patient was a 14-year old boy. Eleven months before admission he was admitted to hospital with progressive disability in speech. Later bilateral 6th nerve palsies developed together with a left hemiparesis. Ventriculogram suggested a pontine lesion and this was confirmed by operation and biopsy. Postoperatively he developed severe bulbar palsy and died 4 months later.
What is bulbar palsy? Bulbar palsy comprises dysarthria, dysphonia and dysphagia resulting from lesions of the motor nuclei in the lower brainstem. Impaired articulation is usually the first feature and then difficulty in swallowing, hoarseness and loss of voice volume supervene.
The specimen is a coronal slice of the hemispheres and of the brain stem. The anterior surface of the pons (on the back of the pot – tricky!) is greatly enlarged and nodular compared to normal (e.g. specimens 13206 and 13271). The basilar artery is largely hidden in a deep groove of tumour tissue. On the cut surface the

normal structure of the pons appears blurred and the whole pons is enlarged. There is no obvious focal lesion and no evidence of haemorrhage or necrosis. The medulla also is somewhat enlarged. The lateral ventricles are slightly dilated.
Diagnosis: Astrocytoma of the pons (confirmed histologically)

CASE 9094
The patient was a woman aged 50 who had complained of headache and tiredness for 4 years and deterioration of vision for 4 months. An arteriogram showed a lesion in the right parietal lobe.
The specimen consists of the lower half of the brain divided in the transverse plane. The right lateral ventricle is greatly dilated and the septum pellucidum is deviated markedly to the left. The right ventricle is partially filled by a large papillary mass measuring some 60 x 30 x 30 mm, lying in a dilated posterior ventricular horn. Adjacent to the mass the ventricular wall is eroded and roughened.
Diagnosis: Choroid plexus papilloma (confirmed histologically). The papillary nature and location of the lesion strongly suggest this diagnosis. In this region - the lateral ventricle - common tumours include ependymoma, meningioma, choroid plexus papilloma and metastatic carcinoma.

CASE 9198
The patient was a 35 year old man who 10 days before admission had been involved in a motor car accident. There were no immediate after-effects but after an interval of 7 days he developed severe headaches and vomiting. The following day he developed a 3rd nerve palsy and the day after that he became unconscious. He was admitted to hospital and a craniotomy was performed. The offending lesion was removed but it recurred 5 days later, and the patient died on the 9th day of his hospital admission.
The specimen comprises the superolateral surface of both cerebral hemispheres (back of pot) and a section of dura (front of pot). The dura has a large amount of blood clot adherent to it. In the cerebral hemispheres, the surface of the right frontal lobe is obviously depressed, with some blood in the sub-arachnoid space.
Diagnosis: Acute subdural haematoma
Comment: The history of trauma, with a prolonged interval before the onset of symptoms, is related to the venous nature of the bleeding, as opposed to the arterial bleeding in extradural haematomas, which present in a more acute manner. Note also the clinical features of raised ICP and tentorial herniation.

CASE 9258
The patient was a man aged 33 whose illness lasted 7 weeks. It began with a sudden right 3rd nerve palsy, and then a facial paralysis, ascending paralysis and eventual coma. The clinical diagnosis was encephalomyelitis. At post-mortem the brain was large and soft and small white plaques were visible in the basal cisternae. The cord was greatly enlarged by tumour in the subarachnoid space.
The specimen consists of the spinal cord displayed in two pieces. For most of its length, it is greatly distended by a fleshy pale mass that obscures its normal architecture.
Diagnosis and comment: The most likely cause for such a diffuse enlargement of the spinal cord would be tumour, the most likely being ependymoma or astrocytoma. Either of these would be a reasonable differential diagnosis on macroscopic examination. However, histology revealed this tumour to be a medulloblastoma, which just goes to show that macroscopic appearances, including imaging, can be deceptive.

CASE 9438
A previously well 60-year old man complained of feeling giddy, before slowly slumping on to the table and losing consciousness during breakfast. His feet were noticed to be twitching and he was said to have been sweating profusely.
On admission to hospital, he was deeply unconscious with increased right-sided tendon jerks and absent right abdominal reflexes. He died a few hours later.

The specimen consists of a transverse section through the cerebellum and includes the medulla and upper cervical cord. Within the left half of the medulla is a well-demarcated dark brown haemorrhagic lesion, 15mm in maximal diameter. The pyramid, inferior cerebellar peduncle and structures along the floor of the 4th ventricle have been relatively spared but the olive, medial lemniscus and other tracts have completely disappeared.
Diagnosis: Intramedullary haemorrhage
Comment: Autopsy showed nephrosclerosis and left ventricular hypertrophy indicating long-standing hypertension, as well as the intracranial findings. The commonest site for hypertension related intracerebral haemorrhage is the basal ganglia, but in approximately 20% of cases it may occur in either the brainstem or cerebellar hemispheres.

CASE 9469
A 31-year old woman was admitted because of malaise, fever and anaemia of 1 month's duration. Examination showed a harsh apical systolic bruit, a palpable spleen and intermittent fever. The haemoglobin was 70g/L (115-165 g/L), the white count was 10 x 10^9/L (4-12 10^9/L). Despite repeatedly negative blood cultures she was given a course of penicillin. The fever persisted. She died from bronchopneumonia, 6 months after onset of symptoms, having been febrile almost all this time.
The specimen consists of the right half of the brain. The meninges are normal. The gyral pattern is normal. There are no obvious focal lesions. There is no sub-arachnoid haemorrhage, no infarcts and no abscesses. Just above the Sylvian fissure, in the lower most portion of the precentral gyrus, there is a small beige nodule, 4mm in diameter, which arises from a small cortical branch of the middle cerebral artery.
Diagnosis: Mycotic aneurysm
Comment: Autopsy showed bacterial vegetations on the mitral valve as well as splenic and renal infarcts.

CASE 9653
The patient was a male 57 years old at the time of his death. For two years before admission he had suffered from progressive weakness, difficulty in walking and dysarthria as well as urinary symptoms (hesitancy, poor stream etc.). On examination he showed signs of severe mental confusion, cranial nerve palsies (right 3rd, 7th and 12th nerves),"pyramidal" signs (spasticity, upgoing plantars) as well as signs usually associated with extra pyramidal disorders (tremor, ataxia, nystagmus). Tests for syphilis were negative. Lumbar puncture was normal and the CSF findings were unremarkable. The patient went steadily downhill, became completely bedridden and severely demented. He died 1 year after admission of bed-sores and urinary sepsis.
The specimen consists of a transverse section through the pons, medulla and cerebellar hemispheres. The pons, medulla and cerebellum are all markedly atrophic (compare with 24437).
Diagnosis: Olivopontocerebellar atrophy
Comment: This is not something undergraduate medical students would be expected to know about. Also known as spinocerebellar atrophy type 1, this is a dominantly inherited disorder that presents in middle age with slowly progressive limb ataxia, slowness of voluntary movement, tremor and occasionally dysarthria, dysphagia, urinary incontinence and occasionally dementia. OPCA is a member of a group of disorders known as multiple system atrophy that are characterised by the presence of cytoplasmic inclusions in glial cells. Other members of this group are striatonigral degeneration and the Shy-Drager syndrome. The common feature is damage to the nigrostriatal dopaminergic system.

CASE 10019
The patient was a 69-year old woman who had osteoarthritis and general debility. She complained incessantly of pain in her back and abdomen and for most of the time was quite disorientated. There were no obvious visual disturbances. She had to be heavily sedated and finally died 7 months after admission from a massive haematemesis, which was found at autopsy to arise from gastric and duodenal ulcers.

The specimen consists of the upper half of the cerebral hemispheres cut in the transverse plane. In the right occipital pole is a dark haemorrhagic lesion with well-demarcated margins and a spongy texture. It is 50mm in maximum diameter and occupies almost the entire occipital lobe. Only a thin rim of cortex is left medially and posteriorly while laterally the tumour itself is visible on the surface of the cerebral hemisphere. Anteriorly the posterior horn of the lateral ventricle is displaced forward. There is no evidence of recent bleeding.
Diagnosis: Cavernous angioma of the occipital lobe

CASE 10124
The patient was a 22-year old clerk suffering from polyarteritis nodosa as well as moderately severe diabetes mellitus, both of recent onset. While in hospital for investigation of his collagen disease and for stabilisation of the diabetes he suddenly developed epileptic fits, a severe rise in blood sugar level and hypertension. He became comatose and died rather suddenly 24 hours after the onset of the fits.
What is polyarteritis nodosa? Classic polyarteritis nodosa is a systemic vasculitis, an inflammatory disease affecting blood vessels, which typically affects small to medium sized muscular arteries, especially in the renal and visceral circulations. This results in aneurysmal dilatation of the vessels, thrombosis and consequent ischaemia and infarction. Classic polyarteritis is not to be confused with the different disease microscopic polyarteritis nodosa or microscopic polyangiitis.
The specimen consists of a coronal slice of the cerebral hemispheres. There is a lesion present within the 3rd ventricle between the two thalami. It is 1.5cm in diameter and cystic, with a thick, pale wall and it is filled with grey gelatinous material. The rest of the brain tissue appears normal – in particular the ventricular system does not appear dilated.
Diagnosis: Colloid cyst of the 3rd ventricle
Comment: This is a condition that may present with headaches, sometimes posture related, or sudden collapse, due to obstruction of CSF flow and thus acute hydrocephalus. Surgical excision may be curative.

CASE 10274
The patient was a man aged 52 with a history of vertigo, ataxia, vomiting, headaches and increasing deafness in the right ear for the last 3 months. On examination there was well-marked papilloedema with general weakness of all limbs, the arms more than the legs. The reflexes were equal and active. An angiogram showed a tumour in the region of the septum pellucidum. There was progressive deterioration of intellect and personality and he became incontinent. A needle biopsy was performed and was followed by a right subtemporal decompression. The patient gradually deteriorated and died.
The specimen is a coronal slice of the brain, including the brainstem and cerebellum. A slightly heterogenous lesion 45mm in diameter is present in the region of the left thalamus and basal ganglia. It has poorly defined margins and scattered foci of haemorrhage and necrosis. The lesion has compressed the cavity of the left lateral ventricle and has pushed the septum pellucidum to the right (i.e. there is midline shift). Laterally the tumour encroaches on the internal capsule and has pushed the corpus striatum downward. The back of the specimen shows some oedema of white matter posterior to the tumour, compared to the uninvolved side.
Diagnosis: Glioblastoma multiforme (confirmed histologically) in region of left thalamus/basal ganglia

CASE 10412
A 13-year old boy had been in good health until 6 months before admission when his parents noticed that he was listless and less bright than usual. Three months before admission he had complained of poor vision and during the last 3 weeks he had vomited almost daily. During this time he had also developed headache and diplopia. He had become unsteady on his feet and had experienced several "shaking" attacks during which his arms had trembled. On examination he showed bilateral papilloedema, bilateral 6th nerve palsies and impaired conjugate movement of the eyes. The left pupil was larger than the right and did not react to light or convergence. There was a lower motor neurone right facial weakness. Gross trunk ataxia was

present although limb co-ordination was normal. The arm jerks were depressed, the knee and ankle jerks normal. A ventriculogram showed a large irregular lesion in the posterior part of the 3rd ventricle. Removal was not possible and a ventriculo-cisternostomy was performed. The patient's condition gradually deteriorated and he died 1 month after admission.
The specimen consists of the left half of the brain cut in the sagittal plane. There is a large grey-brown lesion measuring 50 x 35mm filling and expanding the 3rd ventricle. The lesion has well defined margins and a friable appearance. It has deeply indented the midbrain. Within the occipital lobe is a small hole 3mm in diameter (seen through the side of the pot) that is the site of the catheter of the ventriculo-cisternostomy (a hole connecting the lateral ventricle to the cisterna magna).
Diagnosis: The lesion appears to have arisen in the pineal region. The CNS tumours that occur in this position include germ cell tumours, pineal cell tumours, ependymomas, astrocytomas and metastases (unlikely at this age). This case was histologically reported as pinealoma.

CASE 10430
A 58-year old gardener had been suffering from right otorrhoea and a right-sided facial tic for at least 17 years. In the few months before admission he had developed a progressive right facial palsy and deafness, with one episode of acute vertigo. For several days before admission he had been complaining of headache, nausea, and on the day of admission he lapsed into a coma. On admission, he was found to have neck stiffness, right facial palsy, bilateral papilloedema and a temperature of 102.5°F (39.2°C). A lumbar puncture revealed purulent CSF with 20,000 neutrophils/μL, 0.3g/L protein (0.15-0.45 g/L) and 1.4mmol/L glucose (2.8-4.25mmol/L). Pneumococci were seen on direct smears. A skull x-ray showed erosion of the right petrous apex. The patient did not respond to antibiotic therapy and died 36 hours after admission. At autopsy there was an obvious meningitis with features of raised intracranial pressure and transtentorial herniation, as well as a smooth extradural tumour in the right middle cranial fossa.
The specimen consists of the right side of the base of the skull with the anterior part in the top left hand corner of the pot. The petrous bone has been sawn in its long axis so that the middle ear structures and the cut surface of the lesion are displayed. There is a large mass covered by dura and measuring up to 50mm in diameter within the middle cranial fossa. The cut surface shows the mass to be composed of friable grey material.
Diagnosis: Cholesteatoma
Comment: These are cystic lesions associated with chronic otitis media, are lined by keratinising squamous epithelium, sometimes with mucus-secreting epithelium, and are filled with amorphous keratinous debris, often including cholesterol crystals. There is frequently surrounding foreign body type giant cell inflammation. They involve the middle ear and erode surrounding bone, rarely even into soft tissues of the neck.

CASE 10452
A woman aged 35 presented with a 1-month history of right temporo-occipital headache, giddiness and diplopia. Examination showed intellectual impairment, nystagmus, bilateral papilloedema, left-sided facial weakness, left-sided incoordination and decreased tone in the left limbs. Ventriculography demonstrated a space-occupying lesion in the right basal ganglia and bilateral ventriculo-cisternostomy was performed. A right Babinski response developed post-operatively and the patient died 4 weeks later.
The specimen consists of the right half of the brain cut in the sagittal plane. In the midline is a bisected pale rounded mass 35mm in diameter that replaces the 3rd ventricle and involves thalamus and hypothalamus. The mass has a fairly uniform appearance apart from 2 slightly darker foci that suggest necrosis. The margins are mostly well defined apart from infero-posteriorly where the lesion infiltrates the midbrain and 4th ventricle.
Diagnosis: Astrocytoma of basal ganglia region

CASE 10570
The patient was a man aged 33 who was found confused and incoherent and was sent to a mental institution. The only positive clinical findings were crepitations in the left axilla. He remained irrational and next day was found unconscious with dilated pupils. He died that day.
The specimen is a portion of the spinal cord and a separate transverse slice thought the brain stem and cerebellum. There is marked fibrinous exudate, congestion and haemorrhage surrounding the midbrain. Opaque exudate covers the anterior surface of the pons and the folia of the cerebellum, particularly of the superior vermis. There is involvement also of the spinal cord with congestion in the subarachnoid space.
Diagnosis: Tuberculous meningitis

CASE 11801
The patient was a man aged 77 who died in 1958. He had contracted syphilis during the 1914-1918 war. He was admitted to hospital in June 1946 with lightning pain down the legs. On examination, Rhomberg's sign was positive. The Wasserman reaction was strongly positive. He was treated with penicillin and bismuth injections and improved. He was lost to follow-up. In 1958 he complained of pains in the left arm and forearm and numbness of the left 4th and 5th fingers with hyperaesthesia to pinprick and loss of light touch in the ulnar distribution. He had been incontinent of urine for 6 years. The pupils were reported as normal. Permission was given for limited post-mortem involving only the spinal cord.
The specimen is of the spinal cord. The cord is markedly atrophic as are the posterior spinal nerve roots in all areas and the leptomeninges are slightly thickened.
Diagnosis: Tabes dorsalis
Comment: This is a manifestation of tertiary syphilis and is characterised by the signs and symptoms of demyelination of the posterior columns, dorsal roots and dorsal root ganglia.

CASE 12535
A known hypertensive aged 57 suddenly lost consciousness and was admitted to hospital where he was noted to be in a deep coma with a temperature of 109°F (42.8°C). He died shortly after admission.
The specimen consists of the right half of the brain divided in the sagittal plane, including the brainstem and cerebellum. Within the posterior aspect of the pons and extending into the 4th ventricle is a well-demarcated haemorrhagic lesion measuring 2.5cm in maximal diameter.
Diagnosis: Pontine haemorrhage

CASE 12684
The patient was a woman aged 82. For 3 days before admission she became steadily more drowsy and disorientated. The right Babinski sign was positive. BP was 170/90. Her renal function gradually deteriorated and she died on the 5th day.
The specimen is a coronal slice through the cerebral hemispheres viewed from behind. Within the left parietal lobe there is an area measuring 40 x 30mm in which the cortex has a dark brown haemorrhagic appearance and the underlying white matter is oedematous and swollen. The abnormalities are restricted to the vascular territory of the left middle cerebral artery. The left lateral ventricle is compressed and here is some midline shift to the right.
Diagnosis: Haemorrhagic infarct in left middle cerebral artery territory

CASE 13206
The patient was a girl aged 12 with a 2-week history of headache, photophobia and vomiting followed by confusion and drowsiness. On examination there was early papilloedema, fluctuating left hemiparesis, neck stiffness and a pyrexia of 102°F (38.9°C). Lumbar puncture showed elevated protein, low sugar and 700 leucocytes/μL, mostly lymphocytes. Frontal burrholes and ventricular tap obtained tubercle bacilli. Treatment with streptomycin and INH had little effect. Her condition deteriorated with increasing

hydrocephalus. Pleural effusions and patchy lung opacities developed and she died 7 weeks after admission.
The specimen is the lower half of the brain divided in the transverse plane. The cut surface shows marked softening and necrosis of the entire basal ganglia on each side as well as of the genu of the corpus callosum and the right frontal lobe white matter. The lateral walls of the anterior horns of the lateral ventricles are nodular. On the reverse of the specimen the meninges over the brain stem and optic chiasm are cloudy.
Diagnosis: Tuberculous meningitis with acute tuberculous encephalopathy
Comment: Acute tuberculous encephalopathy is thought to represent a hypersensitivity phenomenon complicating tuberculous meningitis. It particularly occurs in children in countries where tuberculosis is common. At post-mortem, active pulmonary tuberculosis was found in the apical segment of the right lower lobe together with involved lymph nodes in the mediastinum above the right main bronchus. These features are of primary pulmonary tuberculosis.

CASE 13271
The patient was a man aged 75 who had chronic discharge from the right ear for several months. A right radical mastoid operation was performed 6 weeks before admission. Five weeks later he became dysphasic with spastic limbs and hyperactive reflexes. A temporal lobe abscess was considered and a right occipital burrhole was made. No evidence of cerebellar abscess was found. The ventriculogram was normal. After the operation he remained comatose and developed gangrene of the right leg and died.
The specimen consists of a transverse section through part of the cerebellum together with the pons and medulla. Within the right cerebellar hemisphere is a circular cavity 20mm in diameter that has destroyed the dentate nucleus. The lesion is lined by sloughy grey-white material. The margins are well demarcated but there is no definite surrounding gliosis.
Diagnosis: Abscess of the right cerebellar hemisphere

CASE 13461
The patient was a woman aged 68. A carcinoma of the breast had been treated by radical mastectomy, radiotherapy, oophorectomy and adrenalectomy. She was maintained on cortisone. She gradually became semicomatose and developed exophthalmos. She was thought to be in Addisonian crisis but did not respond to replacement therapy and died.
What is an Addisonian crisis? This results from an acute deficiency of glucocorticoids. Manifestations include nausea, vomiting, hypotension and dehydration. It may occur in patients with Addison's disease (where the adrenal glands have been destroyed e.g. by autoimmune disease, metastases or tuberculosis) whose regular exogenous steroid dose becomes insufficient due to intercurrent disease or is rapidly reduced or withdrawn, or in patients with acute destructive processes of the adrenal glands such as massive haemorrhage.
The specimen is of the dura and falx. Large confluent nodular lesions are present on the inner surface. They are pale brown in colour, with focal haemorrhage and have well defined margins.
Diagnosis: Secondary carcinoma (primary in breast)

CASE 13564
The patient was a woman pedestrian aged 40 who died 30 hours after being struck by a car. On admission there was a fractured pelvis and fractured ribs with a left pneumothorax. She developed a stiff neck and signs of cerebral damage. Her condition steadily deteriorated until death.
The specimen consists of transverse slices of the hemispheres and the brain stem and cerebellum. Numerous small petechial haemorrhages are scattered throughout the corpus callosum with similar haemorrhages in the white matter at the frontal pole, on the medial aspect of each hemisphere towards the occipital pole, in the middle cerebellar peduncles, among the pyramidal fibres of the pons and in the septum pellucidum. The reverse of the specimen shows symmetrical swelling of the hemispheres with obliteration of

the lumina of both lateral ventricles. There is no evidence of any contusions or lacerations. The cerebellar tonsils and uncal regions are not present to assess the presence of herniation.
Diagnosis: Traumatic brain injury with generalised oedema and vascular markers of diffuse axonal injury

CASE 13636
The patient was a man aged 68. Three weeks before admission he began to experience severe headaches after an attack of influenza. These remitted but then recurred and became continuous. Photophobia was then noticed and on the day before admission he vomited. On examination there was an old perforation in the right ear-drum. The BP was 210/110 and the reflexes were normal. Lumbar puncture produced clear fluid with a faint excess of globulin. No culture was taken. He was considered to have aseptic meningitis. Mild neck stiffness and Kernig's sign persisted and he became much more drowsy. Carotid arteriography showed no abnormality. A diffuse encephalitis was considered. Lumbar puncture was then repeated and the fluid was found to be grossly turbid with 3800 polymorphs and 22 lymphocytes per μL. The direct smear showed gram-positive cocci in pairs and short chains. He died on the 5th hospital day despite massive doses of penicillin, chloromycetin and sulphadiazine.
The specimen is of the brain divided in the transverse plane. The cut surface shows an irregular appearance of the lining of the lateral ventricles, with what appears to be sloughing exudate present in the anterior horns bilaterally. The base of the brain is covered by a similar sloughing cream exudate. The meninges over the cerebral hemispheres show some opacification, especially parasagittally, but this is not marked.
Diagnosis: Suppurative meningitis

CASE 13808
The patient was a woman aged 63. Two weeks before admission she lost consciousness during the night and on examination there was a stiff neck and bilateral Babinski responses. Lumbar puncture showed blood-stained CSF and arteriograph revealed an aneurysm of the left middle cerebral artery. Her condition was improving but then she suddenly deteriorated and died.
The specimen is the lower half of the brain sectioned in the transverse plane. On the cut surface there is an irregular lesion 65x40mm, which is dark brown/haemorrhagic and has well defined margins. The lesion has extensively disrupted the cortex and underlying white matter in the region of the Sylvian fissure. The left lateral ventricle is compressed and there is midline shift to the right. On the under surface of the brain the tip of the left temporal pole has been removed post-mortem to expose the left middle cerebral artery to reveal a collapsed saccular aneurysm measuring about 15 x 5 x 5mm on its trunk about 15mm from its origin. A small amount of sub-arachnoid haemorrhage is present on the underside of the left frontal lobe. In addition there is notching of the left uncus and secondary (Duret's) haemorrhages within the pons.
Diagnosis: Ruptured saccular (berry) aneurysm of the left middle cerebral artery with predominantly intracerebral haemorrhage and features of raised intracranial pressure with transtentorial herniation

CASE 14252
A man of 84 had giddy turns for about a year. He was admitted after lapsing into a coma, accompanied by involuntary movements of the limbs. On examination his BP was 190/100 and there was left facial paralysis and left hemiparesis with a left up-going toe. His level of consciousness deteriorated and he became febrile. A lumbar puncture was performed: pressure 200mm H_2O (70-180mm), clear fluid, no cells, protein 0.7g/L (0.15-0.45 g/L). Signs of pneumonia developed and he died on the 4th day.
The specimen is a transverse section of the brain stem and cerebellum through the mid-pons. The basilar artery is atherosclerotic and its narrowed lumen is occluded by recent antemortem thrombus. The pons appears abnormal with necrotic softening present within the anterior two-thirds (top of pot). The cerebellum is essentially unaffected.
Diagnosis: Basilar artery thrombosis with pontine infarction
Comment: The history of giddy turns for about a year is suggestive of vertebrobasilar insufficiency.

CASE 14699

The patient was a man aged 22. For 4 months there was increasing frontal headache latterly associated with vomiting. Neck stiffness had been present for about 2 months with numbness of the left face, left jaw and left side of the tongue for one week.

On examination the left pupil was larger than the right and reacted less briskly; ocular movements were full. There was some blunting to pinprick in the 2nd and 3rd divisions of the left 5th nerve. Ventriculogram showed moderate dilation of both lateral ventricles and of the 3rd ventricle. A midbrain tumour was diagnosed and a biopsy was taken at a posterior fossa exploration. Histology revealed a very cellular tumour, possibly medulloblastoma, pinealoma or ependymoma. Total removal was impossible and his condition steadily deteriorated for two further months until his death from bronchopneumonia.

The specimen consists of two pots, one containing a portion of the calvarium (skull) and the other a sagittal slice of the left half of the brain. Within the brain specimen is a dark mass about 30mm in diameter in the region of the colliculi, superior to the cerebellum. The lesion has a heterogenous appearance and ranges in colour from pale grey-brown to dark brown and haemorrhagic. It has well defined margins but is causing downward displacement of the superior cerebellar vermis and is growing towards the aqueduct.

The specimen of calvarium shows a large shallow round swelling within the parietal bone. The inner aspect has the appearance of normal bone. It measures 90mm in diameter and 30mm in thickness.

Diagnosis and comment: The differential diagnosis of tumours in this region (pineal) is germ cell tumour, astrocytoma, ependymoma, metastatic carcinoma and pineal cell tumours. This one histologically was reported as a pinealoblastoma.

In the old catalogue, the bone lesion was reported to be a calcified subdural haematoma. However, the lesion does not appear to be subdural as the dura seems to have been removed.

CASE 14707

The patient was a woman aged 56. Three years previously she had a right pneumonectomy for a tumour reported to be a non-malignant bronchial adenoma. She remained well until 4 months before her last admission when Jacksonian fits occurred affecting the right tongue, right thumb and right side of the mouth, together with dysphasia. On examination there was loss of 2-point discrimination on the right side and a right extensor plantar response. An electro-encephalogram confirmed a lesion in the left parietal lobe. Four months later there was twitching of the right face and arms, tinnitus in the left ear with giddiness, clumsiness and diplopia. There were several focal fits. Finally there was weakness of the right arm and leg. A diagnosis of subacute spongiform encephalopathy was made. She developed complete right hemiplegia with complete loss of power and hyperreflexia. Her speech further deteriorated and a right visual field defect developed. Her condition gradually deteriorated and she died.

What is a Jacksonian fit? This is a partial motor seizure which takes the form of involuntary movements e.g. of the hand, which begin in a restricted region and then slowly progress to include a larger portion of the extremity (Jacksonian march), as the seizure activity progressively involves larger areas of the motor cortex.

The specimen is of a coronal slice through the cerebral hemispheres, viewed from the front. Within the left fronto-parietal hemisphere is a well-demarcated oval lesion 50mm in maximum diameter. The lesion is covered by a thin rim of cortex. It has a pale lobulated appearance with no haemorrhage. It has caused herniation of the left cingulate gyrus beneath the falx.

Diagnosis: Secondary carcinoma

Comment: At post-mortem there were scattered lesions in the left lung and a lesion 3cm in diameter in the posterior cerebellar vermis. This was a metastasising lung carcinoma with a great histological resemblance to bronchial adenoma (now an out of date term).

CASE 15082
The patient was a 61-year old man who presented with a headache on the night before admission. On admission he was disorientated and had a stiff neck. The CSF showed pneumococci and 300 polymorphs. Despite therapy and a decompression burrhole being performed, his cerebral state deteriorated until his death.
The specimen is a transverse section through the cerebral hemispheres.
The meninges appear opaque over the hemispheres bilaterally. A small amount of recent sub-arachnoid haemorrhage is present over the right frontal pole. A haemorrhagic nodule 6mm in diameter is also present in this region. On the cut surface it can be seen that the hemispheres are symmetrically swollen with compression of the lateral and third ventricles. There are small haemorrhages in the region of the basal ganglia, the largest 10 x 5mm situated in the right internal capsule. There also appears to be some blood in the anterior horns of the lateral ventricles.
Diagnosis: Suppurative meningitis
Comment: The subarachnoid haemorrhage and haemorrhagic nodule over the right frontal region are related to the burrhole.

CASE 15477
The patient was a boy aged 5 years who had recurrent morning vomiting for 8 months. Three weeks before admission he became ataxic with falling to the left.
On examination there was marked papilloedema and ataxia of the left arm, leg and foot. The patient underwent an operation but severe haemorrhage occurred during the procedure and he died on the table.
At post-mortem there was marked reverse tentorial herniation of the left lobe of the cerebellum upwards through the tentorial notch.
Without looking at the specimen, on the basis of the symptoms where do you think the lesion might be? The lurching to the left and the ataxia in the left arm and leg suggest a left cerebellar hemisphere lesion.
The specimen consists of a transverse slice through the medulla and cerebellum. Within the vermis and the left cerebellum is a partially cystic mass that measures 30 x 20mm. The solid parts of the mass are homogenous and pale. The mass has reasonably well defined margins and it compresses the 4th ventricle.
Diagnosis and comment: In children the two most likely tumours in this location are medulloblastoma and astrocytoma. In this case histology revealed the tumour to be an astrocytoma. Such cerebellar astrocytomas in children are often at least partially cystic.

CASE 15979
The patient was a man aged 81. Twelve months previously he had a mild CVA from which he recovered completely. Nine months later he suffered a right hemiplegia from which he made only a partial recovery. He died from bronchopneumonia.
The specimen is the lower half of the brain divided in the transverse plane.
There are three areas of abnormality.
The first is within the left frontoparietal region, where there is an area 80 x 45mm in which there is white matter necrosis and yellowing, with thinning of the overlying cortex, in the distribution of the left middle cerebral artery territory.
Within the medial aspect of the left occipital lobe there is an area 50 x 25mm that shows petechial haemorrhages within the cortex and oedema and softening of the underlying white matter. This lesion is in the distribution of the left posterior cerebral artery.
In addition there is an area of ill-defined softening 25 x 10mm within the white matter of the right occipital lobe, just posterior to the hippocampus.
Diagnosis: Multiple cerebral infarcts
Comment: As the infarct in the left middle cerebral artery territory is large and not completely healed, this represents the lesion causing the stroke 3 months before death. As a result of swelling associated with the

infarction, there has been an increase in intracranial pressure, leading to compression of the posterior cerebral arteries by the unci as they herniate through the tentorium, resulting in the two haemorrhagic PCA infarcts, in this case left greater than right.

CASE 16025

The patient was a woman aged 36 who had worked as a clerk for 14 years. She was dismissed from her position 6 months before admission because of forgetfulness and inattention. It was also noticed that the patient swerved from one side of the road to the other while driving and had a tendency to veer to the left. A month later she had a "blackout" and was admitted to hospital. Bilateral papilloedema was present and a skull film showed a large area of calcification to the right of the midline above the pituitary fossa. Angiogram showed a tumour circulation in the central region. A fronto-parietal craniotomy was performed but she died a week later.

The specimen is a sagittal slice of the right half of the brain divided in the sagittal plane through the lateral ventricle. The third ventricle has been completely replaced by a haemorrhagic mass measuring 65 x 40mm with foci of necrosis and ill-defined margins. It extends to involve the corpus callosum that is stretched over the top of the mass. On the reverse of the specimen the lateral ventricle is dilated and the mass can be seen to invade its wall. The areas of haemorrhage within the white matter of the frontal lobe are the result of surgical intervention.

Diagnosis and comment: This tumour could be arising from the ventricle or the basal ganglia region. The commoner tumours of the basal ganglia region include glioblastoma multiforme, astrocytoma and metastatic carcinoma. This case was slightly unusual, with histology revealing the tumour to be an oligodendroglioma.

CASE 16062

This is a surgical specimen from a woman who had had a lump on the medial aspect of the left elbow for many years. It became tender, with pain both locally and radiating down the ulnar distribution. On examination a firm irregular indurated tumour could be felt in the left ulnar nerve extending upwards for 75mm from the medial epicondyle. There was some wasting of the left hypothenar eminence but no weakness or sensory loss. The mass was excised.

The specimen consists of a longitudinal section of nerve including the lesion. It consists of 3 ovoid swellings, the largest measuring 30 x 10mm. The lesions are encapsulated with a relatively homogenous cut surface without evidence of haemorrhage or necrosis.

Diagnosis: Schwannoma/neurilemmoma of ulnar nerve

CASE 16084

The patient was a woman aged 72. Sixteen years ago she suffered a complete left hemiplegia that did not improve. After 4 months she was transferred to a rehabilitation unit and remained there until her death from cardiac failure and uraemia.

The specimen is of the right half of the brain. There has been marked loss of tissue from areas of the parietal and temporal lobes, which is covered by a thickened, collapsed grey membrane. No other abnormalities are seen.

Diagnosis: Old right middle cerebral infarction

Comment: This appearance follows liquefactive necrosis.

CASE 16091

A man aged 63 was admitted to hospital with pneumonia affecting the right middle and lower lobes. It responded slowly to antibiotics but later a pleural effusion developed that contained malignant cells. Bronchoscopy showed a carcinoma in the right main bronchus. Radiotherapy was administered for a short while but had to be stopped because of the patient's poor condition. His final admission lasted only a few days during which he was noted to have polydipsia and polyuria.

The specimen is of a sagittal slice of the left half of the brain. There is no atrophy, the gyral pattern is normal and there is no evidence of haemorrhage or infarction. Anterior to the mamillary body and above the optic chiasm in the hypothalamus a 1cm diameter nodule, which has well demarcated margins and a uniform tan appearance with no haemorrhage, necrosis or cavitation.
Diagnosis: Metastatic carcinoma in hypothalamus
How are the pathological findings related to the clinical history? The hypothalamic lesion, highly likely to be a metastasis from the lung carcinoma, may have caused the polydipsia and polyuria via impaired production of antidiuretic hormone.
Comment: At post-mortem a large undifferentiated carcinoma was present in the hilum of the right lung with metastases in the mediastinum, liver and adrenals.

CASE 16136
The patient was a man aged 68 whose mental condition had been deteriorating over the preceding 6 months until he was no longer able to look after himself. He was found in a confused state and admitted to a regional hospital where he became stuporose. He was transferred to the RAH and on admission there he was found to respond to painful stimuli and to verbal commands but was mute. His left pupil was larger than the right but both reacted to light. There was right facial paresis and weakness of the right arm.
The specimen consists of the upper half of the cerebral hemispheres together with the overlying dura mater. The dura mater has been reflected back from the left hemisphere to expose an extensive flattened dark brown-black, solid but friable mass adherent to its undersurface. It is about 5mm deep and in areas is covered by a delicate wispy membrane. In addition there is some flattening of the surface of the left hemisphere especially in the parietal region. The reverse of the specimen shows some compression of the left lateral ventricle and midline shift to the right.
Diagnosis: Chronic subdural haematoma
Comment: The subdural haematoma was diagnosed during life. The patient underwent an operation and the haematoma was removed. He improved for a few hours but then relapsed into mutism and died suddenly on the 7th hospital day. A massive pulmonary embolism was found at post-mortem, originating from thrombi in the femoral and iliac veins.

CASE 16183
The patient was a motor cyclist aged 32 who ran into a truck. He died a few hours after the accident without regaining consciousness.
The specimen is of the lower half of the hemispheres cut in the transverse plane, together with 3 transverse slices of the brain stem. There is extensive cortical laceration and contusion affecting the under surface of the right frontal lobe and the tip and lateral aspects of the right temporal lobe. There is also some subarachnoid haemorrhage affecting the undersurface of the left frontal lobe. There is marked notching of the right uncus and hippocampus. The cut surface (on the back of the specimen) shows marked acute swelling of both hemispheres, especially the right, with virtual obliteration of both lateral ventricles.
There are many large haemorrhages in the brain stem affecting particularly the upper pons in the tegmental area though there are also some haemorrhages among the pyramidal fibres.
Diagnosis: Traumatic brain injury with contusions, diffuse oedema and transtentorial herniation

CASE 16218
The patient was a diabetic aged 70 who had a large basal cell carcinoma on the left forehead for 15 years. He sustained a pathological fracture of the right femoral neck that was plated, and an osteogenic sarcoma was excised from his left 4th rib. On his last admission he was cachectic and radiotherapy was given to the skull, femur and chest. He died from bronchopneumonia.
The specimen consists of a coronal slice through the frontal lobes, viewed from the front, and a transverse slice through the cerebellum and mid-pons. Within the left frontal lobe is an oval, cavitated lesion 35mm in diameter in the subcortical white matter. The cavity has an irregular, necrotic lining but the margins appear

well demarcated. There is congestion of surrounding vessels. On the reverse of the specimen the lesion can be seen to be in communication with the anterior horn of the left lateral ventricle, the lining of which also appears congested. The section through the cerebellum and mid-pons shows the lining of the 4th ventricle to be covered with irregular exudate.
Diagnosis: Left frontal lobe abscess, with rupture into the lateral ventricle and widespread septic ventriculitis

CASE 16295
The patient was a woman aged 63 who presented with a 10-day history of malaise, headache, fever (39.4°C), dysphasia and right-sided weakness. On examination a right hemianopia and a to-and-fro aortic murmur were found. Multiple blood cultures were negative; EEG suggested a deep left mid-temporal focal lesion and skull x-ray showed pineal shift to the right. Left carotid angiogram also showed shift to the right. The ESR was high and there was a neutrophil leucocytosis. After a week in hospital she died 5 hours after inhaling vomitus.
The specimen consists of a transverse slice through the cerebral hemispheres. In the occipital lobes are two rounded lesions, one in each occipital pole and measuring 20 to 25mm in diameter. The lesions are cavitating and lined by irregular thick necrotic cream material surrounded by a grey rim of gliotic cerebral tissue. There is oedema of the adjacent white matter. A small patch of acute haemorrhage in the subcortical white matter is present posterior to the lesion on the left side. The meninges appear normal. The reverse of the specimen shows quite marked notching of the left uncus and hippocampus.
Diagnosis: Bilateral occipital lobe abscesses with left uncal herniation
What is the possible pathogenesis of this condition? In this case one would strongly have to consider infective endocarditis as a cause because of the murmur. Brain abscesses are most frequently caused by direct spread of infection from a chronic suppurative otitis media or a chronic mastoiditis. However, the site of the abscesses in this case is not consistent with these possibilities. Another source of haematogenous dissemination of infection (e.g. bronchopneumonia) is a possibility and another cause (though no history in this case) is penetrating head injury.
Comment: At post-mortem there was calcific aortic stenosis without fresh vegetation and two small metastatic renal abscesses. There was some bronchiectasis in the right lower lobe. So-called 'metastatic' brain abscesses are a recognised complication of the latter condition.
In the cases of otitis media or mastoiditis, it is thought that the adjacent bone becomes infected (chronic osteitis) and is eroded. Infection then extends to the extra - and sub-dural space and thus the adjacent brain. It is thought that the reason that patients don't develop meningitis is the result of local obliterations of these spaces by chronic inflammation.

CASE 16406
The patient was a man aged 54 who was admitted with a right hemiparesis and aphasia and progressed to coma with signs suggesting brain stem compression. There was a history of chronic hypertension and on admission the BP was 200/160. He died on the 4th day.
The specimen is a transverse slice through the cerebral hemispheres. A well-demarcated haemorrhagic lesion measuring 60 x 30mm is present within the left external capsule. It has displaced the left lateral ventricle and the septum pellucidum to the right. The underside of the brain shows very marked notching and transtentorial herniation of the left uncus and hippocampus. There is no evidence of subarachnoid haemorrhage or any saccular aneurysms.
Diagnosis: Left sided intracerebral haemorrhage with transtentorial herniation

CASE 16566

The patient was a man aged 62 whose illness began 10 years previously with poorly defined speech problems. After 6 years he was admitted to the RAH where investigations showed cerebral atrophy but no specific diagnosis was made. A year later he was certified insane and was detained to a mental hospital where his condition fluctuated. He became increasingly restless and developed incontinence and he was said to have had an epileptic seizure. He died of bronchopneumonia.

The specimen consists of the right half of the brain divided in the medial sagittal plane. The arachnoid mater and subarachnoid vessels have been removed. The gyri, especially in the frontal region, are somewhat thin and atrophied and the intervening sulci are widened. The temporal and occipital lobes are less affected. There is no evidence of haemorrhage, infarction, infection or any mass lesion.

Diagnosis: Alzheimer's disease (confirmed on histology).

What are the main histological features of Alzheimer's disease? The main features are senile plaques (containing amyloid), neurofibrillary tangles, neuronal loss and amyloid angiopathy.

CASE 16656

The patient was a man aged 49 whose illness began with mild headache followed by confusion and drowsiness lasting a few days. Two weeks later there was a similar attack which was a little more severe, and with left hemiplegia and slight neck stiffness. Because he was an alcoholic, subdural haematoma was considered and he was transferred to the RAH from the country. On examination his pupils were equal and reacted briskly to light. His eye movements were spontaneous in all directions except upwards. There was a left facial paresis. An angiogram showed evidence of a large right temporal lobe clot. At operation some solid clot was aspirated and a right middle cerebral saccular aneurysm was found, clipped and tamponaded by muscle. After the operation he remained drowsy with a left hemiparesis. A large irregular liver was discovered and the possibility of hepatocellular carcinoma was considered. He died a few weeks later.

The specimen consists of a transverse slice through the pons and cerebellum. Within the right side of the pons is a single well-demarcated round lesion measuring 25 x 28 mm. The lesion has a heterogenous appearance with white to grey to focally haemorrhagic and necrotic areas (see back of specimen also). It has replaced most of the right side of the pons and has distorted the upper end of the 4th ventricle.

Diagnosis: Pontine metastasis

Comment: At autopsy there was a renal cell carcinoma with multiple metastases in the lungs also.

CASE 16846

A boy of 19 was involved in a car crash in the country and was admitted to hospital with multiple injuries, including multiple fractures of long bones including one humerus and both lower legs. He had been concussed but by the next day he was speaking although he was irrational. On the 2nd day he became flushed, stuporose and cyanosed. Fat globules were present in the urine and in the tracheal aspirate. A petechial skin rash appeared, particularly in the loins. His condition deteriorated and he died on the 5th day.

The specimen consists of a coronal slice of the cerebral hemispheres and a transverse slice through the cerebellum and brain stem. Small petechial haemorrhages are present in the white matter of the hemispheres and in the splenium of the corpus callosum. The grey matter is largely spared. Haemorrhages are more numerous in the cerebellum, where they occur particularly in the white matter of the folia in the lateral lobes.

Diagnosis and comment: There are many causes of petechial haemorrhage (in addition to haemorrhagic infarction) in the CNS including:

- trauma: diffuse axonal injury, fat embolism
- infections: cerebral malaria, viral meningoencephalitis
- septicaemic shock
- bleeding disorders e.g. thrombotic thrombocytopenic purpura, DIC
- hypertensive encephalopathy

- allergic hypersensitivity

In this case, the history of trauma and fat globules in the urine indicate fat embolism.

CASE 16876

An old man of 86 was knocked over by a car and died the next day. Multiple fractures were found at post mortem and the right frontal lobe of the brain felt cystic.

The specimen is a coronal slice through the frontal poles. The white matter of the right frontal pole is cystic and stained a rust red brown. The overlying cortex appears relatively well preserved.

Diagnosis: Old traumatic brain injury

Comment: Liquefactive necrosis that causes the cystic nature (though this is not a true cyst) of the lesion does not happen overnight. The rust brown discolouration is due to the accumulation of the breakdown products of blood (haemosiderin). So there must have been a lesion that occurred at least 6 months prior, probably longer that involved bleeding in the right frontal pole. Intracerebral haemorrhage may be the result of hypertension, but this is not a typical location. Trauma is a much more likely cause for this appearance in this location.

CASE 17008

A man of 36 collapsed and died in the street. There was a previous history of epilepsy and headaches.

The specimen consists of a coronal section through the fronto-parietal region, seen from the front. A large brown right-sided parasagittal mass measuring 80 x 50mm severely distorts the brain, causing midline shift. It is attached to the overlying dura mater and has well defined encapsulated margins, does not infiltrate brain tissue and there is no evidence of haemorrhage or necrosis.

Diagnosis: Parasagittal meningioma

CASE 17473

The patient was a man aged 69 who suddenly lost consciousness and fell. On examination there were signs of a left hemiplegia. The BP was 180/120. He was known to be hypertensive for several years and 5 years previously had had a stroke.

The specimen is the lower half of the brain divided in the transverse plane.

A large amount of sub-arachnoid bleeding fills the basal cisternae and covers the lower surface of the brain. There is a large fusiform aneurysm 30mm in length and 20mm in width involving the trunk of the basilar artery that deviates to the right of the midline. All the basal vessels are ectatic and grossly atherosclerotic. The cut surface shows dilation of both lateral ventricles with a small amount of blood in the posterior horn of the left lateral ventricle. In the white matter of the right frontal lobe is an old cystic softening 30x15mm.

Diagnosis: Sub-arachnoid haemorrhage due to ruptured atherosclerotic aneurysm of the basilar artery

CASE 17775

The patient was a boy of 13 who had been vomiting intermittently for about 10 months. More recently there had been morning headache and progressive ataxia. On examination there was bilateral papilloedema, ataxia, nystagmus and a right 6th nerve palsy. He underwent an operation that was complicated by massive bleeding into the 4th ventricle and blockage of the draining catheters. He died the following day.

The specimen consists of the left half of the brain divided in the sagittal plane.

A large haemorrhagic mass measuring 50 x 40mm arises in the midline of the cerebellum and fills the 4th ventricle. The mass has well demarcated margins and a slightly variegated appearance with some pale and grey areas. The cerebellar cortex is stretched over the surface of the mass. There is some dilatation of the lateral ventricle and fresh blood in the 3rd ventricle. The aqueduct is blocked by tumour.

Diagnosis and comment: The lesion is obviously a tumour. The commonest cerebellar tumours seen in children are medulloblastoma and astrocytoma. Histology revealed this lesion to be a medulloblastoma.

CASE 17868
A man aged 42 had been known to have acute myeloid leukaemia for 5 months. He was treated with chemotherapy with a good initial response. When symptoms recurred the drug therapy was changed to methotrexate. His haemoglobin and white count fell and the platelet count remained very low despite transfusions. Leucocytes then rose eventually to 32 x 10^9/L (4-12 x 10^9/L) with 98% myeloblasts. On the day before his death he fell out of bed and was found to be comatose with a dilated right pupil. He died next day without regaining consciousness.
The specimen consists of a coronal slice of the hemispheres and a transverse slice of the brain stem and cerebellum. Scattered haemorrhagic lesions are present in the white matter of the hemispheres and in the right substantia nigra. They vary up to 1cm in diameter and are sharply demarcated from the surrounding brain. Similar haemorrhagic lesions are present in the tegmentum of the pons. A larger haemorrhagic lesion is present in the right cerebellar hemisphere and measure 45 x 25mm. The cavity of the 4th ventricle contains fresh blood.
Diagnosis: Intracerebral haemorrhages in acute myeloid leukaemia
How can you relate the pathological findings to the clinical history? In acute leukaemias the bone marrow is filled with neoplastic white cells that replace the normal cell population. Chemotherapy may also contribute to low numbers of normal blood cells via the destruction of normal cells in the marrow. As a result patients frequently have anaemia, neutropenia and thrombocytopenia. In this case thrombocytopenia has resulted in intracerebral haemorrhage.

CASE 18483
The patient was a man aged 66 with a past history of Parkinsonism and mitral stenosis. His illness began with sudden collapse with inability to move and mental disorientation. He was admitted to hospital restless and confused but his condition improved only slightly and he died on the 2nd day.
The specimen is a coronal slice through the cerebral hemispheres viewed from behind. There is an area of petechial haemorrhage within the cortex in the right parietal lobe in the territory of the right middle cerebral artery. This territory is also oedematous.
Diagnosis: Recent haemorrhagic infarction of right MCA territory
How might the pathological findings be related to the patient's history of mitral stenosis?
Haemorrhagic cerebral infarctions are typically caused by embolism. In this case it could have been from thrombus in the left atrium caused by atrial fibrillation, mitral stenosis being a classic cause.

CASE 18858
A woman aged 68 had been treated for bladder carcinoma for 2 years by radiotherapy. Eight months before death she became giddy and ataxic, with gradually increasing deafness. Lumbar puncture at that time was highly suspicious for malignant cells.
Radiotherapy was administered to the whole brain area but she became comatose with deviation of the head and eyes to the right. Just before her death a repeat lumbar puncture showed malignant cells.
The specimen is the lower half of the brain divided in the transverse plane.
The cut surface shows relatively little abnormality apart from slight general swelling.
There is opacity and cloudiness of the meninges on the base of the brain, particularly on the orbital surface in front of the optic chiasm and over the inferior surfaces of the cerebellar hemispheres.
Diagnosis: Meningeal carcinomatosis

CASE 18985
A girl aged 16 developed headache with projectile vomiting. After 2 weeks there was failing vision and drowsiness. The clinical signs and carotid angiogram indicated a space-occupying lesion in the left hemisphere. Craniotomy was performed and clear fluid was obtained by needle aspiration but she died 30 hours later.
The specimen consists of the lower half of the brain divided in the transverse plane.

There is a 30mm diameter cystic lesion (packed with cotton wool) in the substance of the left temporal lobe. The lining of the cavity cannot be seen, but the margins appear well defined. There is some trauma and haemorrhage in the white matter anterior to the lesion in keeping with recent aspiration. In addition, there is an area of haemorrhagic discolouration of the left occipital cortex. There is a patchy sub-arachnoid haemorrhage over the inferior surface. There is marked left uncal notching.

Diagnosis and comment: There is a cystic lesion within the left temporal lobe. There are a number of possible causes. Any cause of necrosis (e.g. infarction, trauma, abscess) can cause a cystic lesion due to the CNS phenomenon of liquefactive necrosis, some cysts are developmental and some cerebral tumours have a cystic component. But:

- the location is not in keeping with the classic distribution of ischaemic necrosis and the patient was only 16
- the absence of any other lesions and the lack of haemosiderin staining argue against old trauma
- the history suggestive of a space occupying lesion with a relatively acute onset of symptoms is against a developmental cyst
- although tumours such as astrocytomas can occasionally present as cysts, this is typically seen in the cerebellum rather than the cerebral hemispheres
- the lack of fever and the relatively smooth walls argue against an abscess.

The remaining possibility is that this represents a parasitic cyst, and in Australia the most common cause is hydatid cyst. At post mortem this cyst contained hydatid membrane and scolices. Hydatid cysts are the result of infection by *Echinococcus granulosus,* the sheep tapeworm. The disease in humans is caused by the ingestion of eggs in dog faeces, which then hatch in the duodenum and invade the organs of the body, typically the liver. Many larvae are destroyed but those that survive encyst. These cysts slowly increase in size, so that in 5 years time they may be up to 10cm in diameter. After about 6 months, daughter cysts appear within them. Symptoms may result from mass effects, or if there is rupture, patients may present with anaphylaxis.

What has caused the petechial haemorrhages in the left occipital lobe? These indicate haemorrhagic infarction due to compression of the left posterior cerebral artery from transtentorial herniation as result of raised intracranial pressure.

CASE 19099

The patient was a woman aged 40 at the time of her death. Her illness had begun 10 years previously with tinnitus, ataxia and facial paralysis, which gradually worsened over 3 years. An operation was performed and at craniotomy a large soft tumour was incompletely removed from the region of the cerebellopontine angle. The post-operative course was uneventful and the ataxia disappeared. Her facial paralysis was treated by an extra-oral splint. Three years later she presented again with headache, ataxia, blurred vision and gain in weight. On examination the left corneal reflex was depressed and there was complete deafness in the left ear, but there was no ataxia. Four years later headache recurred and a few months thereafter papilloedema was noted. Following a total hysterectomy for suspected uterine carcinoma the abdominal wound broke down, her condition deteriorated and she died 2 weeks later.

The specimen consists of the medulla and cerebellum cut in the transverse plane.

The left side of the medulla is markedly distorted by a well-demarcated red-brown mass, 35 x 25mm. The mass has no evidence of haemorrhage or necrosis and greatly compresses and distorts the medulla

Diagnosis: Meningioma of cerebellopontine angle (confirmed by histology)

CASE 19393

The patient was a woman aged 55 with a right hemiparesis following a reported stroke 11 years previously. Two years ago she had an episode of left hemi-anaesthesia with vertigo. She presented on this occasion with a 2-day history of increasing headache, drowsiness, vomiting and confusion. On examination she was semicomatose but rousable. The BP was 190/125. The right pupil was dilated and responded poorly to

light. There was paresis of the right 6th, 7th and 12th nerves and the right limbs were hypertonic with a positive Babinski sign. She died 24 hours after admission.
The specimen consists of the lower half of the brain divided in the transverse plane.
There is a very large fusiform atherosclerotic aneurysm of the basilar artery measuring 50 x 30 x 35mm. Both vertebral trunks are ectatic and atherosclerotic and enter the lower pole of the aneurysm. The wall of the aneurysm is atherosclerotic and the smaller dilated portion at its most anterior end, represents a dilated left posterior communicating artery. The aneurysm has not ruptured. There is very marked distortion of the anterior surface of the pons and medulla. The back of the specimen shows moderate dilatation the lateral ventricles and the 3rd ventricle. There is no evidence of old infarction or haemorrhage in the hemispheres.
Diagnosis: Atherosclerotic aneurysm of the basilar artery

CASE 19985
A woman aged 62 had suffered a cerebral embolus from a mitral valve prosthesis 2 years previously. There had also been emboli to the legs that were removed surgically (i.e. the emboli presumably). Some weeks before her death she was in hospital again with vague mental symptoms including an inability to write. At that time she had an epileptiform fit commencing in the right leg and spreading over the whole body. No other focal neurological signs were found. She remained confused and gradually deteriorated until her death from pneumonia.
The specimen consists of a coronal slice through the cerebral hemispheres. There is a well-defined mass 40 x 50mm in diameter within the medial aspect of the left hemisphere and compressing it. The mass has a slightly heterogenous appearance with no haemorrhage or necrosis. Within the medial aspect of the right hemisphere is a small area of red-brown discolouration 13 x 3mm, with an overlying layer of intact grey matter in keeping with an old haemorrhagic infarction.
Diagnosis: Parasagittal meningioma with old infarct

CASE 20114
The patient was a trainee nurse. The illness began at the age of 20 with progressive weakness and after a time also altered sensation in the legs. Neurological examination indicated a spinal lesion at about T2 level. Decompression was performed. Despite this the lesion gradually progressed and finally a tracheostomy was required. She died of bronchopneumonia at age 24.
The specimen is spinal cord from the region of the medulla downwards. There is a smooth ovoid enlargement of the upper cord over a distance of about 100mm. Posteriorly there is some laceration and irregularity, presumably from the laminectomy. On the upper cut surface of the specimen the central canal is visibly dilated.
Diagnosis: Astrocytoma of spinal cord (confirmed histologically)
Comment: Most tumours of the spinal cord are ependymomas, astrocytomas or metastases.

CASE 20468
The patient was a woman aged 50. A neuroma had been removed from "one of the nerves in her head" a year previously but it had recurred. During the second operation she suffered a cardiac arrest and died 6 days later.
What is a neuroma? Which nerves in the head are commonly affected? A neuroma is a benign tumour of a peripheral or cranial nerve. The more accurate name would be neurilemmoma or schwannoma, as they arise from Schwann cells. They may arise on a peripheral nerve, but are frequently seen in the CNS, most often on the VIIIth cranial nerve, hence their other name, acoustic neuroma. Traumatic neuromas are not really tumours at all but refer to the mass that may result from incomplete healing of a severed peripheral nerve.
The specimen consists of the lower half of the brain divided in the transverse plane, with part of the brainstem and cerebellum dissected away. Within the left cerebellopontine angle is a well-circumscribed grey haemorrhagic tumour 20mm in diameter that is apparently separate to but deeply indents the

brainstem and cerebellum. There is haemorrhage in the adjacent brain and the cavity of the 4th ventricle is compressed. On the cut surface of the brain there is an area of haemorrhagic discolouration of the cortex in the territory of the right middle cerebral artery.
Diagnosis: Acoustic neuroma (neurilemmoma or schwannoma) with recent small right middle cerebral artery infarction
Comment: Acoustic neuromas are also known as neurilemmomas or schwannomas and are tumours of the nerve sheath composed of Schwann cells. They are slowly growing encapsulated tumours that do not infiltrate but can cause considerable distortion of adjacent tissue. The commonest cranial nerve affected is the VIIIth, but schwannomas can also arise from the Vth cranial nerve; spinal nerve roots (especially posteriorly) as well as peripheral nerves. Bilateral acoustic neuromas are common in neurofibromatosis type 2.

CASE 20508
The patient was a man aged 28. At age 21 muscle weakness began, first affecting the left side and later the right. Later there was paraesthesia in the right hand. Myelogram showed a large mass in the upper cervical spine. The patient underwent operation at age 22 but symptoms quickly recurred and at a second operation a month later the lesion had greatly increased in size. Post-operative radiotherapy was given and the patient was transferred to the Northfield Wards where he remained for 6 years until his death. Finally he was quadriplegic with no movement of legs, arms or trunk and absence of sensation below the shoulders. There were recurrent urinary and chest infections, bedsores and osteoporosis. Finally he developed high fever, a leucocytosis of 24 x 10^9/L (4-12 x 10^9/L) and died of extensive bronchopneumonia.
The specimen is a coronal slice through the brain, together with the upper end of the spinal cord. The hemispheres, midbrain, pons and cerebellum appear essentially normal. The medulla and the cervical cord are greatly expanded by a pale partly necrotic mass. There is brown haemosiderin staining in keeping with old haemorrhage around the cord.
Diagnosis and comment: The two commonest primary tumours of the spinal cord are ependymoma and astrocytoma, and either would be a reasonable diagnosis on the basis of the macroscopic appearance. Histology revealed the tumour to be an ependymoma.

CASE 20523
The patient was a man aged 21. He was alleged to have fallen from a horse and suffered a stellate fracture of the right occipital bone.
The specimen consists of the lower half of the brain divided in the transverse plane, with a portion of the dura (see bottom of pot). There is a collection of blood on the external surface of the dura and it can be seen to compress the postero-inferior aspect of the right occipital lobe and the adjacent right cerebellar hemisphere. There is bilateral patchy subarachnoid haemorrhage on the undersurfaces of both frontal lobes and on the cut surface of the specimen, a small area of petechial haemorrhage is seen in the left frontal lobe anteriorly. The right cerebellar tonsil appears prominent.
Diagnosis: Extradural haematoma in posterior fossa with contre-coup contusion and tonsillar herniation
How can you relate the pathological findings to the clinical history? Extradural haemorrhage is typically the result of tearing of a meningeal artery often as a complication of skull fracture. The fact that the fracture was in the occipital bone indicates that the man hit the back of his head, thus the frontal lobe contusion represents a contre-coup lesion. The extradural haemorrhage would act as a space-occupying lesion in the posterior fossa leading to raised pressure and probable tonsillar herniation and death from respiratory arrest.

CASE 20524
The patient was a boy aged 15 who had been in a car crash 3 months previously, where he sustained a right subdural haematoma. This was treated but he remained decerebrate until his death.
Describe the physical findings in a decerebrate patient. The patient has an abnormal posture with rigid extension of the arms with internal rotation; rigid extension of the legs with internal rotation; downward pointing toes and backward arching of the head. It is an indication of severe injury at the level of the brainstem or diffuse cortical dysfunction.
The specimen consists of the right half of the brain divided in the coronal plane. Within the right fronto-parietal region is a cystic lesion up to 50mm in maximal diameter. The wall of the lesion appears to consist of a mixture of thin grey membrane and atrophic, focally haemosiderin stained cortex. The anterior horn of the right lateral ventricle in this region is dilated, as is the foramen of Monro. The medial surface of the hemisphere also shows cortical damage in the frontal region and in the cingulate gyrus.
Diagnosis: Old traumatic brain injury

CASE 20546
A woman aged 60 had been hypertensive for 2 years and presented with a rapid failure of vision progressing for 5 weeks with headache and confusion. On examination she showed impaired visual acuity and marked bitemporal hemianopia. At craniotomy a mass obliterating the 3rd ventricle was found and biopsy was taken and radiotherapy commenced. She died of bronchopneumonia a few weeks later.
The specimen is a sagittal slice of the left side of the brain. Within the hypothalamus and extending into the optic chiasm is a somewhat variegated poorly defined lesion 25mm in diameter with probable necrosis.
Diagnosis and comment: Pre-mortem biopsy had apparently revealed a well-differentiated astrocytoma of the hypothalamus. At post-mortem there were large areas of necrosis with marked intravascular thrombosis probably caused by radiotherapy.

CASE 20637
A woman aged 62 who had been diabetic for 4 years suffered a left hemiparesis from which she made a quick recovery. Three months later she was found unconscious at home, and was admitted to hospital. On examination her BP was 200/110 and lumbar puncture revealed uniform blood staining of the CSF. She remained unconscious for 3 weeks until her death from bronchopneumonia.
The specimen consists of a coronal slice through the cerebral hemispheres viewed from the back. On the left side within the vascular territory of the middle cerebral artery is an area 65 x 35mm in maximal dimensions in which there is haemorrhagic discolouration of the cortex and softening of the white matter in the parietal lobe. On the right side in similar vascular territory is another lesion, measuring 50 x 35mm, in which there is atrophy of the gyri and underlying white matter with focal red-brown haemosiderin staining.
Diagnosis: Older (right side) and recent (left side) haemorrhagic middle cerebral artery infarcts
According to the clinical history given, how old are each of the infarcts? The older right-sided infarct occurred 3 months and 3 weeks prior to death, being responsible for the initial left hemiparesis. Three months later (3 weeks before death) the left-sided infarct occurred causing her collapse with unconsciousness.

CASE 20677
The patient was a diabetic woman aged 55, who was admitted from a private hospital where she had been for 12 days suffering from a right hemiplegia. On admission to the RAH she was drowsy, aphasic and responded sluggishly to commands. Her BP was 170/120 and blood glucose was raised. During the next two weeks her renal failure gradually deteriorated and she died.
The specimen consists of a coronal section of the cerebral hemispheres viewed from behind with a well-demarcated haemorrhagic lesion 30 x 30mm within the left basal ganglia and internal capsule. It has compressed the left lateral ventricle and there is some midline shift.
Diagnosis: Intracerebral capsular or deep cerebral haemorrhage

CASE 20785
The patient was a man aged 67 with a 5 month history of loss of weight of 12.7kg, bone pain and "neurological deficiency". On examination there was loss of power of both arms and clubbing of the fingers. X-ray showed lytic lesions in many vertebrae. He died 3 weeks after his final admission.
The specimen consists of a coronal slice of the frontal lobes together with part of the overlying dura mater. On the cut surface of the specimen, predominantly on the left side, it can be seen that the dura is covered by an ill-defined irregular mass that consists of multiple tiny cysts. The mass extends on both sides of the dura and can be seen to focally invade the left superior frontal gyrus.
Diagnosis: Metastatic carcinoma in dura mater
Comment: At post mortem a large primary tumour was found in the lower lobe of the right lung and sections of the dural lesion showed a mucin-forming adenocarcinoma.

CASE 20961
The patient was a male pedestrian aged 16 years struck by a car. He lived for 10 days following the accident but remained deeply unconscious. The right pupil reacted to light but the left pupil was fixed and dilated.
The specimen consists of two coronal slices through the cerebral hemispheres and a transverse slice through the upper pons. Both hemispheres are swollen and the cavities of the lateral ventricles are markedly compressed. There are several small patches of sub-arachnoid haemorrhage. Scattered petechial haemorrhages are present within the corpus callosum, which appears to have ruptured focally. Minor contusions are present in the right cingulate gyrus and in the superior frontal gyri bilaterally. In addition there is an area of haemorrhage within the right dorsolateral quadrant of the pons and some grooving with tiny haemorrhages in both parahippocampal gyri.
Diagnosis: Traumatic brain injury with cerebral oedema, transtentorial herniation and vascular markers of diffuse axonal injury
Comment: These changes in the corpus callosum and haemorrhage in the dorsolateral quadrant of the pons are commonly seen in association with severe diffuse axonal injury. Acceleration/deceleration injuries cause shear and tensile stresses that lead to widespread disruption of axons. Impact of the head against a hard object is not necessary for this damage to occur thus there is frequently no associated skull fracture. There is no lucid interval. It is the commonest cause of severe permanent disability after head injury.

CASE 20974
The patient was a woman aged 64. She had a 4 month history of headaches with a right hemiplegia, dysphasia, confusion and disorientation for the last 15 days. On examination she showed expressive dysphasia, right hemianopia and right hemiplegia. Burrhole biopsy and an osteoplastic craniotomy were performed but she did not improve and died 10 weeks later.
The specimen shows two coronal slices through the cerebral hemispheres, viewed from the front. The left cerebral hemisphere is greatly enlarged and distorted by a poorly defined round mass measuring 70mm in diameter. The lesion has a variegated appearance, ranging from pale cream to grey in colour with areas of necrosis. The left hippocampus is notched.
Diagnosis: Cerebral malignancy
Comment: The features here suggest a primary malignancy and would be in keeping with a glioblastoma multiforme. Metastatic tumour is also a possibility. At post-mortem there was a large mass in the wall of the ileum about 90cm from the ileo-caecal valve that was reportedly lymphoma and the cerebral lesion was also reported to be lymphoma. Lymphomas may occur in the brain as part of systemic disease but may also arise primarily in the brain, either sporadically or in patient's with impaired cell mediated immunity e.g. AIDS patients.

CASE 21010
The patient was a man aged 53 who had a 14 year history of a degenerative neurological condition which had left him bedridden for the last 2 years. He was found to have abnormal groping movements. His parents and 5 siblings were alive and well.
The specimen consists of two coronal slices of the cerebral hemispheres with marked atrophy of the heads of the caudate nuclei and to a lesser extent of each corpus striatum. Both lateral ventricles are dilated, with concavity of their lateral walls over the caudate nuclei, and the 3rd ventricle is also dilated.
Diagnosis: Huntington's disease
What clinical features would you have expected the patient to have had during life? Huntington's disease is an autosomal dominant disorder in which symptoms usually begin in middle age. The disease typically starts as a tendency to fidget, which develops into jerky choreic movements. The patient's personality may become truculent, irritable or apathetic. The disease progresses with dementia. In cases where patients are aware of a family history, suicide is common.

CASE 21099
The patient was a 38 year old woman who suffered from hypertension (BP200/140) secondary to advanced pyelonephritis. Her last illness began with a very severe frontal headache of sudden onset while she was gardening. On admission she was drowsy but cooperative and her neck was stiff. Lumbar puncture showed grossly blood-stained xanthochromic CSF. There was little change in her condition until the 7th day when she developed signs of right hemiplegia and she died the next day.
The specimen consists of the lower half of the brain divided in the transverse plane. At the origin of the left middle cerebral artery is a 10mm saccular aneurysm with an adjacent focus of recent sub-arachnoid bleeding. The reverse of the specimen shows petechial discolouration of the cortex and slight swelling within the vascular territory of the left middle cerebral artery.
Diagnosis: Ruptured left middle cerebral saccular aneurysm with subarachnoid haemorrhage, complicated by a left middle cerebral artery territory infarct.
Explain the pathogenesis of the infarct. The break down products of blood can lead to irritation with vasospasm of vessels in the subarachnoid space leading to infarction, typically occurring 4 to 14 days after the bleed.

CASE 21117
The patient was a woman aged 83 who had apparently been in good health until 1 week before admission when she began to have difficulty with swallowing and talking. Her condition rapidly deteriorated. On admission she was almost mute. She died a week later from bronchopneumonia.
The specimen comprises the upper portion of the cerebral hemispheres. The dura has been reflected back from the surface of the right hemisphere. A large lesion 40mm in diameter arises from the under surface of the dura of the right fronto-parietal region and compresses the underlying brain leaving a smooth depression. The tumour has a nodular pale appearance and although it has compressed the cortex, it has not invaded it.
Diagnosis: Meningioma
Comment: This specimen has the classic appearance of a meningioma, the essentially benign tumours that grow from the dura and compress but do not invade the underlying brain. Surgical excision is usually curative. Uncommonly the tumour may recur, especially if there has been incomplete removal.

CASE 21260
A 41 year old alcoholic presented to the Port Lincoln hospital in delirium tremens and was treated with intravenous vitamin B. Shortly thereafter he had a vascular collapse with acute renal failure complicated by *Pseudomonas* septicaemia. He was transferred to the QEH where a renal biopsy showed acute tubular necrosis. Peritoneal dialysis was commenced. He then suffered a cardiac arrest and had a minor epileptic fit. He died 9 months later.

The specimen consists of two coronal slices through the cerebral hemispheres and a transverse slice through the brain stem and cerebellum. There are scattered, ill-defined lesions characterised by necrosis of white matter with some thinning of the overlying cortex. These necrotic areas are within the parasagittal regions of the hemispheres, the basal nuclei, the infero-lateral aspects of the temporal lobes and in the cerebellum laterally.
Diagnosis: Watershed cerebral infarction
How can you relate the pathological findings to the clinical history? An episode of prolonged hypotension has occurred, leading to acute tubular necrosis as well as areas of necrosis in the brain. The affected areas are, however, not within the vascular territories of the cerebral arteries. They are at the boundaries of the main cerebral and cerebellar arteries. These are the areas that are perfused most poorly at times of severe and prolonged hypotension leading to infarction.
Comment: With complete cessation of cerebral blood flow, as during a cardiac arrest, a different pattern of damage may arise. There is widespread selective neuronal necrosis (see specimens 50116/88A and B), with selected neurones in the cerebral cortex, hippocampus, basal nuclei and the Purkinje cells of the cerebellum being most affected. In the context of a cardiac arrest at normal body temperature, complete clinical recovery is unlikely if the period of arrest is more than 10 minutes. Adequate cerebral perfusion does not start immediately the heart starts pumping again, and any period of pre or post- arrest hypoperfusion is also important in determining outcome.

CASE 21267
A boy of 14 was admitted with a one-week history of lethargy, sore throat, painful swellings in the neck, anorexia, abdominal pain and pleuritic chest pain. Examination showed multiple enlarged tender lymph nodes in the neck, axilla and groins, and enlargement of the liver and spleen. Blood count showed a white cell count of 36.4 x 10^9/L (4-12 x 10^9/L) (myeloblasts 95%) and a platelet count of 24 x 10^9/L (150-400 x 10^9/L). Three days later he suddenly became unconscious with a fixed dilated right pupil and bilateral upgoing toes. He died 2 hours later.
The specimen consists of two coronal slices through the cerebral hemispheres that demonstrate two well-demarcated heterogenous haemorrhagic lesions measuring 30mm and 45mm within the subcortical white matter of each parietal lobe. Some blood is present in the overlying subarachnoid space. No vascular malformations are seen.
Diagnosis: Intracerebral haemorrhages related to thrombocytopaenia in leukaemia
Explain the clinical features and explain how the pathological findings are related to the clinical history. The boy had an acute leukaemia indicated by the elevated white cell count with large numbers of myeloblasts. The bone marrow was filled with neoplastic white cells that replaced the normal cell population. The resulting anaemia caused lethargy; sore throat and pleuritic chest pain were probably due to infection secondary to low numbers of normal neutrophils; the leukaemic cells infiltrated his lymph nodes, liver and spleen (resulting in abdominal pain) and severe thrombocytopenia has resulted in spontaneous intracerebral haemorrhage. This has caused raised intracranial pressure with transtentorial herniation and compression of the right oculomotor nerve leading to dilatation of the right pupil; compression of the cerebral peduncles has lead to bilateral upgoing plantars.

CASE 21342
The patient was a 35-year old male inmate of a mental hospital. A chronic left otitis media was first investigated at the RAH 7 months previously. A *Proteus* organism was grown and there was a central perforation of the eardrum. On his final admission there was a one week history of deterioration in mental state with neck stiffness and vomiting. The temperature was 101.4° F (38.6°C) and there were no localising neurological signs. Lumbar puncture showed turbid CSF with 0.15 g/L protein (0.15-0.45 g/L). Culture grew *Proteus*, diphtheroids and gram positive cocci. His WCC was 14.6 x 10^9/L (4 - 12 x 10^9/L) with 83% neutrophils. A day later he became increasingly drowsy and he died on the 3rd day.

The specimen consists of two coronal slices through the cerebral hemispheres. Within the left temporal lobe is a cavitating lesion measuring 25 x 35 mm, lined by irregular pale slough. The cavity appears to communicate with the adjacent lateral ventricle, which is filled with yellow-grey exudate.
Diagnosis: Temporal lobe abscess

CASE 21359
The patient was a man aged 47 with a long history of hypertension with levels of about 200/120 despite active antihypertensive therapy. He was admitted comatose and died 3 weeks later without regaining consciousness.
The specimen consists of a transverse section through the cerebellum and brain stem. There is a well-demarcated haemorrhagic lesion 45 x 30mm within the vermis and left cerebellar hemisphere. On the back of the specimen it can be seen that there is prominence of the cerebellar tonsils alongside the medulla suggesting herniation. The basal vessels are grossly atherosclerotic and tortuous, but there is no acute thrombus.
Diagnosis: Cerebellar haemorrhage

CASE 21385
A man aged 53 gave a history of 2 weeks dizziness, hemiparesis and headache. He had been losing weight for 4 months. On examination he was confused and disorientated. There was bilateral papilloedema and a right hemiparesis. Carotid angiogram showed a large fronto-temporo-parietal lesion that was biopsied. He died from bronchopneumonia a week later.
The specimen is a coronal slice through the cerebral hemispheres that demonstrates a 50x40mm mass in the left temporal lobe. The mass has infiltrating margins and a variegated appearance with extensive haemorrhage and necrosis (see back of specimen). There is marked surrounding oedema with notching of the adjacent hippocampus. The cavity of the left lateral ventricle is compressed and the midline structures are deviated to the right.
Diagnosis: Glioblastoma multiforme (confirmed histologically) of temporal lobe

CASE 21463
A man aged 53 was diagnosed with carcinoma of the lung that was treated with radiotherapy. Two months later he was admitted to hospital because of personality changes and finally he was admitted to hospital following a seizure. On examination the only significant finding was a left hemiplegia. Palliative care was commenced and he died 2 weeks later.
The specimen consists of two coronal slices through the hemispheres viewed from behind and a transverse slice through the brain stem and cerebellum. Throughout the specimens are multiple discrete lesions up to 25mm in diameter. They are well-demarcated, pale brown-grey in colour and most show central necrosis. There is one slightly haemorrhagic lesion in the right putamen. There is generalised oedema of the white matter and the ventricular cavities are compressed.
Diagnosis: Metastatic carcinoma
Comment: At post-mortem the primary carcinoma was present in the upper lobe of the right lung and there was involvement of mediastinal nodes and multiple metastases in the viscera. These lesions have the classic appearance of metastatic tumours in the CNS. They are deceptively well-demarcated but the tissue has a quite difference appearance and texture from normal brain substance.

CASE 21585
A man aged 62 had been treated for 5 years for hypertension and angina pectoris. For the last 2 months there had been periodic attacks of dizziness, vomiting, slurred speech and fluctuating consciousness. On admission he was semi-comatose with dilated pupils and there was a possible paresis of extra ocular muscles. Although there were periods of slight improvement his general condition deteriorated and he died 2 months after admission.

The specimen consists of two transverse slices of the brain stem and cerebellum. Within the superior slice are symmetrical areas of yellowing and necrosis within the midbrain, involving the colliculi, the substantia nigra and the oculomotor nuclei. The cerebral peduncles are spared. The basilar artery can be seen in a tortuous course over the midbrain anteriorly and antemortem thrombus can be seen within it. In the lower slice, a similar area of yellow necrosis measuring 30 x 15mm can be seen in the left lateral cerebellar hemisphere.
Diagnosis: Basilar artery thrombosis with midbrain and cerebellar infarction
How can you relate the pathological findings to the clinical history? The man's past history suggests that he might have widespread atherosclerosis: hypertension is a risk factor and he has ischaemic heart disease. The attacks of dizziness, vomiting, slurred speech and fluctuating consciousness suggest vertebrobasilar insufficiency. The findings on examination (although brief) would be in keeping with a brainstem infarct.

CASE 21687
No detailed clinical history is available.
The specimen consists of the lower half of the brain divided in the transverse plane. Within the left cerebellopontine angle is an irregular mass measuring 35 x 20 x 20mm. The surface of the mass is somewhat ragged, but it does not appear haemorrhagic. The mass markedly compresses the adjacent part of the pons. In the lower corner of the jar is a portion of the petrous temporal bone to show the internal auditory meatus, which is eroded and enlarged.
Diagnosis: Acoustic neuroma (neurilemmoma/schwannoma - confirmed histologically)

CASE 21863
The patient was a woman aged 52. Her illness began 15 years previously with minor epileptic fits over about 2 weeks. Five years later she had three generalised convulsions and she became mentally unstable with failing memory. She was diagnosed with dementia.
Seven years later there was progressive dementia, vomiting and mild right hemiparesis and dysphasia. A burrhole biopsy was performed and radiotherapy commenced to the entire cerebrum. Four years later she died in a coma.
The specimen consists of a coronal slice through the cerebral hemispheres.
Within the right periventricular white matter is a mass that measures 40 x 25mm. It has poorly defined margins and contains foci of haemorrhage and cystic change. The mass infiltrates the right caudate nucleus, the right side of the corpus callosum and the internal capsule. Within the left temporal lobe is another separate, very ill-defined lesion measuring 35 x 15mm. It is yellow in colour and has no haemorrhage or necrosis. It extends outwards into the white matter of the left temporal pole and infero-medially into the upper portion of the left cerebral peduncle. The ventricles are not grossly distorted and the septum pellucidum is in the midline.
Diagnosis: Glioblastoma multiforme - bilateral (confirmed histologically)

CASE 21869
The patient was a man aged 84 who was admitted after a sudden right hemiplegia.
On examination he was aphasic and there was a right hemiplegia affecting face, arm and leg with a right extensor plantar response and conjugate deviation of the eyes to the left. He remained aphasic and incontinent and died after 5 weeks from bronchopneumonia.
The specimen is a coronal slice through the cerebral hemispheres. Within the left external capsule and putamen is a well-demarcated dark brown lesion measuring 40 x 20mm. There is no midline shift. A 3mm lacune is noted in the right globus pallidus.
Diagnosis: Capsular or deep cerebral haemorrhage

CASE 21921
The patient was a dairy farmer aged 49 with a 2-3 year history of vague headaches and hypertension. More recently there had been two episodes of falling, with a right-sided headache that persisted after the last fall one week earlier. On admission he was hypertensive (210/130) and on the 4th day he became confused and disorientated, with photophobia, neck stiffness and a positive Kernig's sign. The plantar reflexes were extensor and there was a failure of upward gaze. Lumbar puncture showed bloodstained and xanthochromic CSF. The next day he suffered a cardiac arrest and he died 4 days later.
The specimen consists of the brain divided in the transverse plane. A saccular aneurysm 12mm in diameter arises from the top of the basilar artery and lies exactly in the midline in the interpeduncular fossa. A small amount of sub-arachnoid haemorrhage is present on the base of the brain. On the cut surface, blood can be seen in the 3rd and both lateral ventricles.
Diagnosis: Ruptured basilar artery saccular (berry) aneurysm with subarachnoid haemorrhage

CASE 21978
The patient was a man aged 22 who developed a flu-like illness a month previously. On this occasion he had been away from work for a week because of lethargy and somnolence. When admitted to the Whyalla Hospital there was severe headache, vomiting, neck rigidity and a positive Kernig's sign. Lumbar puncture produced turbid fluid containing 5000 neutrophils/μL and the smear showed gram-positive cocci in pairs. He was treated with sulphanilamides and penicillin in large doses but his level of consciousness deteriorated until he failed to respond to painful stimuli. He became comatose with a flaccid right hemiplegia and was transferred to the RAH. He suffered a cardiac arrest and remained deeply unconscious until his death the following day.
The specimen consists of the upper half of the cerebral hemispheres divided in the transverse plane. The meninges are opaque. The cut surface shows the cerebral hemispheres to be swollen with compression of the lateral ventricles.
Diagnosis: Suppurative meningitis

CASE 22037
The patient was a 50-year old man who presented with abdominal pain and behavioural disturbances. IVP was suspicious of a renal tumour and a chest x-ray showed probable secondary deposits. He suddenly deteriorated and died.
The specimen is a coronal slice through the cerebral hemispheres. Within the left temporal lobe is a well-demarcated lesion measuring 50 x 30mm. It is made up of two distinct areas, the upper portion is variegated in colour ranging from cream to dark brown with areas of haemorrhage and necrosis. The lower portion is haemorrhagic. In addition there is a separate well-demarcated area of haemorrhage 6x3mm in the left parietal lobe. There is midline shift to the right, compression of the 3rd and left lateral ventricles and the left uncus appears notched.
Diagnosis: Metastatic carcinoma

CASE 22081
The patient was a 19 year old female with Trisomy 21 (Down's syndrome) who lived in residential care. She was observed to suddenly lose consciousness and was admitted to hospital. On admission she remained unconscious and was noted to have irregular breathing (Cheyne-Stokes respirations). The right pupil was dilated. A lumbar puncture was performed and the CSF was turbid with increased numbers of leucocytes. She died the following day.
The specimen consists of two coronal slices through the cerebral hemispheres. Within the left temporal lobe is an irregular 30x20mm cavitating lesion lined by pale necrotic slough. The surrounding tissue is oedematous. The abscess has ruptured into the cavity of the left lateral ventricle and both ventricles contain pus. The left parahippocampal gyrus is notched.
Diagnosis: Temporal lobe abscess with rupture into the ventricular system and transtentorial herniation

Comment: Brain abscesses are most frequently caused by spread of infection from a chronic suppurative otitis media, thus the temporal lobe is a common site, or from chronic mastoiditis.

CASE 22095

The patient was a man aged 58 with a history of suppurative otitis media for 16 years. Three weeks before his last admission he complained of right earache and vertigo, ataxia and nystagmus were found on examination. These signs improved with antibiotic therapy.

He was referred for mastoid surgery but on admission he was found to have drowsiness, confusion, neck stiffness, photophobia and mild nystagmus to the right. Lumbar puncture showed 26,000 polymorphs/μL. A brain scan showed a space-occupying lesion in the right posterior temporal region. Ten days later he became unconscious and he died 3 weeks later.

The specimen consists of a coronal slice through the cerebral hemispheres. The specimen is somewhat distorted. Within the right temporal lobe are two lesions, the upper elongated one in the region of the hippocampus, measuring 22 x 5mm and the lower rounder one measuring 20 x 15mm. They both have a similar structure with well-defined margins, a central area of grey yellow amorphous material and a margin of red-brown staining. On the back of the specimen it can be seen that these two lesions coalesce into one. In addition, grey yellow material similar to that within the lesion can be seen lining the 3rd ventricle and right lateral ventricle. A lot of the distortion of the specimen comes from an area in the right parietal cortex, which protrudes above the normal cortical surface and contains numerous haemorrhagic areas.

Diagnosis: Temporal lobe abscess with rupture into ventricular system

Comment: The protruding area in the right parietal lobe is the result of a decompression craniotomy that was performed in an attempt to relieve the dangerously high ICP. Unfortunately, the brain was so swollen that it protruded through the craniotomy site, focally compressing its vascular supply, resulting in the haemorrhagic necrosis at its edge. This phenomenon is sometimes referred to as a fungus hernia.

CASE 22153

The patient was a man aged 83 who had a stroke 2 years ago, resulting in transient dysarthria but no permanent muscular weakness. On the morning of his latest admission he developed dysarthria and left hemiplegia. Two days later he had a severe unexpected haematemesis for which massive transfusion was required, but he died on the 4th hospital day.

The specimen consists of a coronal slice through the cerebral hemispheres. Portions of both common carotid arteries with their bifurcations are also present. Within the left cerebral hemisphere is an area of loss of tissue measuring 40 x 30mm, which involves both grey and white matter and which is partially covered by a grey membrane. This is in the territory of the left middle cerebral artery. On the right side, also in the middle cerebral artery territory is an ill-defined area of swelling with reduced demarcation between cortex and white matter.

One internal carotid artery (probably left, on the right of the jar) is totally occluded by old atherosclerosis and organised thrombus and the artery above the block is reduced to a shrunken fibrous cord. The other (probably right on the left of the pot) internal carotid artery is grossly stenosed by atherosclerosis just above its origin and there is recent antemortem thrombus above.

Diagnosis: Recent and old middle cerebral artery infarctions

Correlate the pathological findings with the clinical history. The old left-sided infarct would have occurred 2 years prior to death, being responsible for the dysarthria at this time. It may well have been caused by occlusion of the left internal carotid artery at its origin or from embolism of thrombus or plaque from it. The very recent right-sided infarct occurred 4 days before death, being responsible for the recent dysarthria and left hemiplegia. There appears to be recent thrombus in the right internal carotid artery that was probably responsible.

Comment: At post-mortem, a large benign duodenal ulcer penetrating the pancreas was found.

CASE 22196
A grossly obese man aged 55 with a longstanding history of hypertension suddenly collapsed half an hour after he had been told that he had won $40,000 in a lottery. On admission he was cyanosed, unconscious and vomiting. His blood pressure was 235 systolic. His pupils were fixed and dilated and there was generally flaccid paralysis. The next day he became febrile and developed glycosuria. He died on the 2nd day.
The specimen is a transverse slice through the brain stem and cerebellum. There is a large irregular area of haemorrhage that almost completely replaces the pons and also extends into the left cerebellar hemisphere. Both cerebellar tonsils appear prominent (back of specimen).
Diagnosis: Pontine and cerebellar haemorrhage with tonsillar herniation

CASE 22197
The patient was a man aged 60 who died from intestinal obstruction.
The specimen is the lower half of the brain divided in the transverse plane. The right vertebral artery shows a fusiform dilatation of up to 10mm in diameter, over a length of 20mm at its distal end, close to where it joins the basilar artery. In addition there is another fusiform aneurysm 15mm in diameter projecting to the left from the lower 20mm of the basilar artery. The upper portion of the basilar artery, the posterior cerebral arteries and the internal carotid and middle cerebral arteries are grossly atherosclerotic.
Diagnosis: Fusiform atherosclerotic aneurysms of the vertebro-basilar system

CASE 22296
A man aged 69 was admitted with a 1 week history of progressive numbness and weakness of the left hand. An arteriogram done the same day showed marked stenosis at the origin of the right internal carotid artery. Surgery and anticoagulants were considered inadvisable. He died on the 5th day.
The specimen consists of the lower half of the brain divided in the transverse plane, together with the two carotid arterial trunks. Right uncal notching can be seen from the front of the specimen as can prominence of both cerebellar tonsils, right more than left. Antemortem thrombus can be seen in the cut end of the right internal carotid artery just lateral to the optic chiasm with atherosclerotic narrowing of the left.
The cut surface of the brain shows marked swelling of the right cerebral hemisphere with midline deviation. There is necrosis with petechial haemorrhage in the right basal ganglia and thalamus. There is mild petechial haemorrhage in the cerebral cortex within the territory of the left posterior cerebral artery suggestive of infarction. The vertebral arteries and basilar arteries show only minor atherosclerotic changes. The separate carotid arteries show atherosclerosis with antemortem thrombus at the origin of the right internal carotid artery (left of pot).
Diagnosis: Massive right cerebral infarction with raised intracranial pressure, tonsillar herniation and transtentorial herniation with probable compression of the left posterior cerebral artery leading to infarction

CASE 22308
The patient was a man aged 58 employed as an orderly at the RAH. He collapsed at work one morning and fell to the left side. On examination he was unable to use the left arm and leg. He was drowsy but responded to questions, stating that he had felt "funny' for 30 minutes before the collapse, but had no headache. He died on the 2nd day.
The specimen is a transverse section through the cerebral hemispheres, sparing the right cingulate gyrus and parasagittal cortex. Much of the right cerebral hemisphere is markedly swollen with blurring of the normally clear demarcation line between cerebral cortex and underlying white matter. This is in the territory of supply of the right middle cerebral artery. Within this area focally towards its anterior end is an area of dark brown haemorrhagic discolouration of the cortex. There is midline shift with displacement of the right lateral ventricle and the right cingulate gyrus has herniated under the falx, causing a notch on its upper surface. A second area of haemorrhagic discolouration is present in the right posterior cerebral artery

territory about 30mm anterior to the occipital pole. The base of the brain (see back of pot) shows marked uncal and parahippocampal gyral notching bilaterally, right worse than left.
Diagnosis: Right middle cerebral artery infarction with right subfalcine herniation, bilateral uncal/transtentorial herniation and probable small right occipital haemorrhagic infarct secondary to compression of the right posterior cerebral artery

CASE 22347
The patient was a man aged 47 with a 5 month history of severe occipital headache followed by the development of a more recent right 5th nerve palsy. Pneumoencephalogram showed decreased air entry in the right cerebellopontine angle and on angiography there was displacement of the anterior cerebral artery to the left. Exploration of the right hemisphere however revealed no tumour. He died after 3 months in hospital.
The specimen consists of the pons, medulla and cerebellum divided horizontally.
The anterior surface of the pons looks markedly abnormal: it is enlarged and nodular. The cerebellar tonsils are prominent. On the cut surface of the specimen is a poorly defined grey mass approximately 30 x 60mm that obscures the normal pontine structure and extends into the white matter of the right cerebellar hemisphere. There are scattered small petechial haemorrhages.
Diagnosis: Astrocytoma (confirmed histologically) of the pons

CASE 22367
A woman of 84 presented with large bowel obstruction resulting from a stenosing carcinoma. The tumour was successfully resected but after the operation she developed congestive cardiac failure and died a month later from pneumonia. The abnormality was an incidental finding at post-mortem.
The specimen consists of the lower half of the brain divided in the transverse plane.
A large saccular aneurysm measuring 20 x 15 x 15mm arises from the junction of the left internal carotid and posterior communicating arteries. There is an artefactual tear in this aneurysm but at post-mortem it was intact and there was no evidence of bleeding. The rest of the basal vessels are grossly atherosclerotic. The brain looks essentially normal.
Diagnosis: Saccular (berry) aneurysm of the left posterior communicating artery

CASE 22386
A woman aged 45 had a 3 week history of lethargy and some slurring of speech, with dizziness and falling to the right. On examination her vision in the left eye was impaired. The plantar responses were both extensor. Imaging showed a lesion in the midline in the region of the corpus striatum. A biopsy was performed. She died a month after admission.
The specimen is a coronal slice through the cerebral hemispheres viewed from behind. Predominantly within the left thalamus/basal ganglia region but extending across the midline, is a lesion measuring 35 x 40mm with well demarcated to focally indistinct margins and a heterogenous appearance. In some areas it looks similar to normal brain tissue (on the infero-lateral aspect, where the margins also appear indistinct) but there are large areas with extensive haemorrhage. The lesion extends downwards into the midbrain and across the midline to involve the right thalamus. The corpus callosum is not involved. The left lateral ventricle is compressed. There is an area of petechial haemorrhages within the cortex of the inferior part of the left temporal lobe. There is grooving of both unci with kinking of both oculomotor nerves by the herniation.
Diagnosis: Glioblastoma multiforme (biopsy diagnosis) of the basal ganglia/thalamic region with transtentorial herniation causing left posterior cerebral artery compression resulting in infarction
Comment: The closeness of the oculomotor nerves to the unci and their susceptibility to being compressed in transtentorial herniation is readily seen.

CASE 22389
A woman aged 50 experienced a sudden sharp right-sided headache while doing light housework. Within 30 minutes it had become generalised, her left arm was weak and she was nauseated. On examination she was drowsy and disorientated with slurred speech. There was a left homonymous hemianopia, a left upper motor neurone 7th nerve palsy and a flaccid paretic left arm. There was left hemianaesthesia excluding the leg below the mid-thigh, with decreased position sense on the left side. Lumbar puncture showed bloodstained CSF. A left 12th nerve palsy became apparent. On the 11th hospital day she suddenly deteriorated and died within a few hours.
The specimen is the lower half of the brain divided in the transverse plane. A saccular aneurysm 7mm in diameter is present within the Sylvian fissure on the right middle cerebral artery some 3cm from its origin. There is surrounding subarachnoid and intracerebral haemorrhage. The right uncus is notched and scattered petechial haemorrhages are present within the midbrain that appears distorted. On the cut surface of the brain is a large well demarcated dark brown/black lesion within the right parietal lobe, which measures 75 x 50mm. A wide zone of oedematous white matter surrounds the lesion. The cavity of the right lateral ventricle is compressed and the septum pellucidum is deviated markedly to the left.
Diagnosis: Ruptured right middle cerebral artery saccular (berry) aneurysm with subarachnoid and intracerebral haemorrhage causing transtentorial herniation

CASE 22392
The patient was a woman of 53 who developed a right spastic hemiparesis. She died after 3 weeks in hospital.
The specimen is a coronal slice through the cerebral hemispheres. In the left parietal lobe is a well-demarcated round lesion measuring 35mm in diameter. The lesion is composed of grey-yellow tissue with central necrosis. In addition there is a smaller lesion 10mm in diameter in the head of the right caudate nucleus. The reverse of the specimen shows a small area of yellow staining in the right subthalamic region.
Diagnosis: Metastatic carcinoma
Comment: At post-mortem there was a large tumour in the left upper lobe of the lung, extending directly in continuity to involve lymph nodes around the bifurcation of the trachea. The area of yellow staining represents haemosiderin deposition following surgical related haemorrhage at the extreme posterior limit of a previous pre-frontal leucotomy about which there were no details in the notes

CASE 22399
The patient was a man aged 60 who presented with haematemesis. A benign gastric ulcer was resected, but the suture line broke down and he developed peritonitis, complicated by a consumption coagulopathy and septicaemia. He died 2 months later. At post-mortem there were friable vegetations on the mitral valve.
The specimen consists of a coronal slice of the cerebral hemispheres. There is a well-demarcated dark brown lesion measuring 15 x 7mm, lying just beneath the posterior horn of the left lateral ventricle. It produces a bulge into the ventricular cavity (which is compressed by surrounding oedema) but has not ruptured into it. In addition there is a small cream lesion adjacent to a sulcus in the right parietal lobe, measuring 15 x 7mm. It has well demarcated margins and signs of early cavitation.
Diagnosis: Septic embolism causing abscess

CASE 22468
A man aged 72 was admitted because of a personality disorder said to result from cerebral metastases. He died 3 weeks later.
The specimen consists of two coronal slices through the cerebral hemispheres. Both slices contain a number of well-demarcated lesions, the largest measuring 35mm in diameter. The lesions have a variegated appearance, with pale yellow to grey tissue and areas of cystic degeneration. There is no evidence of haemorrhage. The ventricles are slightly compressed but there is no midline shift.
Diagnosis: Metastatic tumour

Comment: At post-mortem a carcinoma of the right middle lobe bronchus was found.

CASE 22508
The patient was a woman aged 75 who had been treated for myeloid leukaemia for 2 years. She died during an acute exacerbation.
The specimen consists of a coronal slice through the cerebral hemispheres and a transverse slice through the brain stem and cerebellum. Over the right parietal lobe is a subdural collection of blood 60 x 15mm in cross section. It extends from the median sagittal sinus over the surface of the lobe. A small intracerebral haemorrhage 15 x 10mm is present within the calcarine cortex, on the medial aspect of the right cerebral hemisphere that compresses the lateral ventricle. There is also a haemorrhage within the right lateral aspect of the pons, extending into right middle cerebellar peduncle and cerebellum.
Diagnosis: Multiple haemorrhages (related to thrombocytopaenia in leukaemia)

CASE 22579
The patient was a woman aged 54 who was admitted unconscious. The BP was 210/130 and there was a right hemiparesis. She died on the 2nd day.
The specimen consists of a coronal slice of the cerebral hemispheres. There is a well-demarcated black lesion within the region of left putamen (right side of pot). The lesion has ruptured into the left lateral ventricle that also contains some of the dark material. The left lateral ventricle is compressed and the septum pellucidum is deviated to the right.
Diagnosis: Capsular or deep cerebral haemorrhage

CASE 22666
The patient was a man aged 66 who had suffered from a subarachnoid haemorrhage from an aneurysm of the left middle cerebral artery which had been successfully treated 17 years earlier. He presented with a 5 week history of right-sided headaches and drooping of the right eyelid. On examination the right pupil was fixed and dilated. There was a right ptosis and right 3rd and 7th cranial nerve weaknesses. He became suddenly unconscious with Cheyne-Stokes respiration and died.
The specimen is the lower half of the brain divided in the transverse plane. The tips of the temporal lobes and the medial orbital surfaces have been removed to allow clearer examination of the vessels of the circle of Willis. Almost all vessels are dilated, ectactic and atherosclerotic. The left middle cerebral artery is large and is fed by dilated anterior and posterior communicating arteries. There is marked dilatation of the right middle cerebral artery. There is a saccular aneurysmal dilatation of the upper end of the basilar artery in the inter-peduncular fossa. Marked dilatation of the lateral ventricles is seen on the cut surface of the brain. Fresh blood is present within the 3rd ventricle and the occipital horn of the left lateral ventricle.
Diagnosis: Marked atherosclerosis with aneurysmal dilatation of vessels of the circle of Willis with intra-ventricular haemorrhage
Comment: The basilar artery aneurysm has possibly ruptured directly upwards into the 3rd ventricle.

CASE 22714
The patient was a woman aged 58 who died after an abdominal operation for carcinoma of the colon. Prior to the operation she was noted to have slurring of speech and a two week history of polydipsia and polyuria. On examination there was weakness of both upper and lower limbs with some calf wasting.
The specimen consists of the lower half of the brain, together with the brain stem and cerebellum. There is a large nodular mass 50mm in diameter lying in the left cerebellopontine angle. The mass is clearly demarcated from the adjacent brain tissue and since it has not been cut into, no comment can be made on the presence or absence of haemorrhage or necrosis. A small piece of the petrous temporal bone is attached to the mass. The hemispheres have been sectioned transversely, and their cut surfaces show no particular abnormality. There is marked bilateral cerebellar coning.
Diagnosis: Meningioma of the temporal ridge

CASE 22743
The patient was a man aged 67 years who had been diabetic and hypertensive for many years. He had had a myocardial infarct 3 years previously. He was admitted after a sudden left hemiplegia with unconsciousness. On examination he responded only to pain, the right pupil was fixed and dilated. Both plantar responses were extensor. The BP was 240/110. He died the following day.
The specimen consists of the lower half of the brain divided in the transverse plane. On the cut surface of the specimen is a large well-demarcated dark brown flame shaped lesion within the region of the right basal ganglia and external capsule. The cavity of the right lateral ventricle is compressed and marked midline deviation to the left. There is a small amount of blood in the ventricular system. The reverse of the specimen shows right-sided uncal notching with compression of the left midbrain.
Diagnosis: Intracerebral haemorrhage with transtentorial herniation

CASE 22749
The patient was a man aged 42 who had Hodgkin's disease for 18 years treated by many courses of chemotherapy and radiotherapy. Splenectomy had been performed 8 years previously because of acquired haemolytic anaemia. He was admitted a month before his death with an illness clinically resembling influenza, with fever and myalgia. Para-aortic lymph nodes were enlarged and a course of abdominal radiotherapy was begun.
The specimen consists of the upper portions of the hemispheres divided in the transverse plane. The meninges are generally cloudy with congestion of the cortical veins. There is no septic ventriculitis.
Diagnosis: Suppurative meningitis

CASE 22795
The patient was a woman aged 65 who suffered a right hemiplegia with aphasia, 20 days before death.
The specimen consists of a coronal slice of the cerebral hemispheres. There is a large lesion within the territory of the left middle cerebral artery. The cortex shows patchy grey discolouration, with areas of petechial haemorrhages. The white matter has been completely replaced by a frank haemorrhage that has extended into the left lateral ventricle. The left hemisphere is swollen and there is midline deviation to the right.
Diagnosis: Left middle cerebral artery infarction with haemorrhage (a VERY haemorrhagic infarct).

CASE 22796
The patient was a man aged 67 who suffered a left hemiplegia 5 years before death, with deterioration in mental status. He was confined to an institution until a further massive cerebral infarction occurred a few days before death.
The specimen comprises the entire brain, brainstem and cerebellum. There is loss of tissue involving the entire right anterior and middle cerebral territories. The inferior half of the temporal lobe and the occipital lobe is preserved. The left hemisphere has moved across the midline to take up some of the space. There is thrombotic occlusion of both internal carotid arteries, the left side probably recent. The left hemisphere cannot be further assessed for the presence of infarction or haemorrhage as it has not been sectioned.
Diagnosis: Massive old right-sided infarction

CASE 22810
The patient was a man aged 60 who was admitted after a sudden collapse. He was comatose and unresponsive to painful stimuli with stertorous rapid breathing, hyperpyrexia with proptosis and chemosis of the eyes and with upgoing plantars. He died 13 hours after admission.
The specimen is a sagittal section of the left side of the brain. There is a large, well-demarcated dark brown lesion extensively involving the pons and extending into the midbrain and basal ganglia and it appears to have ruptured into the 3rd ventricle.

Diagnosis: Pontine haemorrhage

CASE 22921
The patient was a woman aged 35 with sarcoidosis, asthma and cardiac failure, who died suddenly. The abnormality was an incidental finding at autopsy.
The specimen consists of a transverse slice of medulla and the cerebellum. In the white matter of the left cerebellar hemisphere, just below the left dentate nucleus, is an abnormal collection of enlarged congested vessels extending over an area 15 x 10mm. There is no evidence of recent haemorrhage.
Diagnosis: Vascular malformation of cerebellum

CASE 23108
The patient was a 68-year old hypertensive woman. She had an episode of left hemiparesis 17 months before admission and made a partial recovery. She was admitted on the final occasion with a similar episode and died within 24 hours.
The specimen consists of the lower half of the brain cut transversely through the hemispheres. The cut surface of the specimen shows a large, flame shaped dark brown lesion with well-demarcated margins measuring up to 70 x 40mm in the region of the right basal ganglia and external capsule. It appears to have ruptured into the posterior horn of the right lateral ventricle that is compressed more anteriorly and the septum pellucidum is deviated to the left. There is haemorrhagic congestion of the occipital cortex with swelling in the right posterior cerebral arterial territory. The reverse side of the specimen shows moderate notching of the right uncus. There is no evidence of old infarction or haemorrhage. Patchy subarachnoid blood is also noted.
Diagnosis: Right intracerebral haemorrhage with transtentorial herniation causing compression of the right posterior cerebral artery leading to infarction

CASE 23147
The patient, a 52-year old man, was admitted with a dense right hemiplegia and hemiparesis. His BP was 160/115. Two days after admission his temperature rose to 40°C, his conscious state deteriorated suddenly and he died.
The specimen consists of a coronal section through the cerebral hemispheres, brain stem and cerebellum. Within the pons is an irregularly shaped dark brown lesion with well-demarcated margins, which extends laterally to involve the left middle cerebellar peduncle. Separate smaller lesions can be seen in the region of the substantia nigra. On the posterior aspect of the specimen, similar dark brown material can be seen in 4th ventricle.
Diagnosis: Pontine haemorrhage

CASE 23151
The patient was a man aged 60 receiving an invalid pension for “inadequate personality”. He had been hypertensive for 7 years. He was admitted with a left hemiparesis, the right pupil was larger than the left and there was conjugate deviation of the eyes to the right. After admission he developed an occlusion of the left profunda femoris artery and died on the 7th day.
The specimen is the lower half of the brain divided in the transverse plane. On the cut surface of the brain is an extensive lesion within the territory of the right middle cerebral artery. It is characterised by the presence of either grey discolouration or petechial haemorrhages within the cortex and oedema of the underlying white matter. The basal ganglia are spared. The cavity of the right lateral ventricle is compressed and the septum pellucidum is deviated markedly to the left. The base of the brain (back of pot) shows marked notching of the right uncus and hippocampus.
Diagnosis: Right middle cerebral artery haemorrhagic infarct with transtentorial herniation

CASE 23243

The patient was a 50-year old man who had been treated at home for pneumonia for 4 days before being found unconscious and incontinent of urine. On examination in hospital he was drowsy but well orientated. His eyes were deviated to the right, he had a left accessory nerve palsy and was incapable of moving his left arm or leg. Over the next four days his left-sided paralysis remained unchanged. Five days after admission he became semicomatose and barely responsive to painful stimuli. He died three hours later.

The specimen consists of the upper part of the brain sectioned transversely through the cerebral hemispheres. There is a thick purulent exudate in the subarachnoid space over the convexities of both hemispheres. It is thinner over the occipital pole.

The cut surface shows mild swelling of both hemispheres, particularly on the right, with some compression of the lateral ventricles. In addition there are some small petechial haemorrhages in the white matter of both hemispheres, with one larger haemorrhage 4 mm in diameter present in the white matter of the right inferior frontal gyrus.

Diagnosis: Suppurative meningitis

Comment: At post-mortem *Streptococcus pneumoniae* was grown from the CSF: apparently no lumbar puncture had been performed during his hospital stay. Other autopsy findings included extensive bilateral bronchopneumonia and cirrhosis of the liver.

CASE 23253

The patient was an 81-year old man who suddenly collapsed at home. On admission he was semiconscious, restless and incoherent. There was no photophobia and neck stiffness was not detected. There were no focal neurological signs. A blood picture revealed a neutrophilia (24.9 x 10^9/L, N 2 - 7.5 x 10^9/L). Apparently no lumbar puncture was performed during his hospital stay. His condition deteriorated steadily and he died two days after admission.

The specimen consists of the lower half of the brain sectioned transversely. An irregular covering of pale exudate is present over the optic chiasm, brainstem and cerebellum. The temporal lobes appear swollen. The cut surface shows swelling of the brain with dilatation of the lateral ventricles that contain the same pale exudate.

Diagnosis: Suppurative meningitis and septic ventriculitis

CASE 23298

The patient was a 41-year old vagrant who was admitted to hospital because of gangrenous lesions on his left foot. He was noted on initial examination to have an aortic systolic murmur. Investigations showed anaemia and blood cultures grew *Streptococcus viridans*. He was thought to have a subacute bacterial endocarditis and treatment with intravenous penicillin was commenced. Over the next 12 days a change in the character of his heart murmur was noted on at least two occasions. A lumbar puncture performed 6 days after admission following the onset of neck stiffness showed 10 polymorphs, 8 lymphocytes and 2,500 erythrocytes per μL and the fluid was xanthochromic.

Two days later the patient developed a right-sided facial weakness over the course of 2 hours. Over the next 3 hours he became disorientated and his state of consciousness deteriorated to the point where he barely responded to pain. He did not move his right side that was hypertonic with exaggerated reflexes and an extensor plantar response.

Five days later neck rigidity was noted and a lumbar puncture demonstrated yellowish pink fluid containing 298 polymorphs, 46 lymphocytes and 6,400 erythrocytes per μL. No organisms were seen and cultures failed to grow any bacteria. The patient remained comatose and eventually died 8 days after the onset of his neurological defect.

The specimen consists of the lower half of the brain sectioned transversely. The cut surface shows an irregular flamed shaped dark brown lesion, measuring 50 x 60mm within the left hemisphere. Similar dark brown material is present within the left lateral ventricle. There is oedema around the lesion and midline deviation to the right. An arrow points to a cortical lesion, which when viewed from the side of the pot can

be seen to be a 7mm aneurysm arising from a cortical artery in the left Sylvian fissure between the superior temporal gyrus and the supramarginal gyrus.
The reverse side of the specimen shows patchy subarachnoid blood around the medullary exit foramina and over the anterior surfaces of the middle cerebellar peduncles.
Diagnosis: Intracerebral haemorrhage due to a ruptured mycotic aneurysm
The heart is displayed in the cardiovascular section of this museum (Specimen 23298).
How do you relate the pathological findings to the bacterial endocarditis? Mycotic aneurysm is a complication of bacterial endocarditis. A septic embolus lodges in a vessel and the bacteria cause infection in the vessel wall, causing it to become weakened leading to the formation of an aneurysm, which may then rupture.

CASE 23424
The patient was a 55-year old woman who had suffered from right-sided headaches for at least a month. These headaches were aggravated by movement and were associated with vomiting. She had developed a left hemiparesis over the ten days before admission, initially manifest by continual dropping of objects held in the left hand. She was admitted to a country hospital where a left hemiparesis was confirmed. A skull x-ray showed a pineal shift to the left. A lumbar puncture was performed. The pressure was 120mm of CSF (70-180mm), no cells were detected and the protein was 0.33 g/L (0.15-0.45 g/L). Her conscious state deteriorated with signs of tentorial herniation and she was transferred to the RAH. A brain scan showed a lesion in the right temporo-parietal region and a biopsy was performed, which suggested cryptococcus, confirmed on study of the ventricular CSF. She was treated with amphotericin B, but continued to deteriorate and despite efforts to decompress the brain, eventually died 6 weeks later.
What is tentorial herniation? And what are potential effects of tentorial herniation?
Tentorial herniation is a complication of raised intracranial pressure, where the medial aspect of the temporal lobe (uncus) and the medial part of the parahippocampal gyrus herniate through the tentorial incisura cerebelli.
The effects of tentorial herniation result from the compression of various structures:
- the ipsilateral III cranial nerve → pupillary dilation (earliest sign and may occur before consciousness is lost)
- the ipsilateral (occasionally contralateral) posterior cerebral artery → infarction of medial occipital lobe
- the contralateral cerebral peduncle against the free edge of the opposite tentorium → hemiparesis on the same side as the expanding lesion. Occasionally the ipsilateral cerebral peduncle is compressed → contralateral hemiparesis
- displacement of the brainstem → stretching and compression of vessels within the midbrain and pons → haemorrhage (Duret's haemorrhages) and infarction of vasomotor centres→ death

The specimen consists of a transverse section of the cerebral hemispheres. The cut surface the right cerebral hemisphere is markedly distorted by a poorly defined mass measuring 70 x 50mm that appears to arise within the white matter of the right parietal lobe. There is some minor haemorrhage and a little necrosis in the lesion. The surrounding white matter is oedematous. The right lateral ventricle is distorted and there is marked deviation of the midline structures. The reverse of the specimen shows marked notching of the right uncus and parahippocampal gyrus and considerable distortion of the midbrain.
Diagnosis: Astrocytoma (confirmed histologically) in right cerebral hemisphere with transtentorial herniation

CASE 23555
The patient was a 77-year old man who had had hypertension for many years, although this had not been treated. He was admitted with a sudden left-sided hemiparesis. He first noticed that he was unable to use his left arm and then he collapsed. He thought that his left leg was also weak. On admission he had a complete left hemiparesis, was unable to look to the left and had a left facial palsy. Muscle tone was increased on the left side and the tendon reflexes were hyperactive. The left plantar reflex was extensor. His blood pressure was 180/110. His general condition deteriorated with a decreasing level of

consciousness and the development of a dysarthria. He developed bronchopneumonia and died as a result of this on the 8th day.
The specimen consists of a coronal slice of the cerebral hemispheres. There is a well-demarcated dark brown lesion 25mm in diameter in the regions of the right basal ganglia and internal capsule. The lesion appears to have ruptured into the lateral ventricle.
Diagnosis: Intracerebral capsular or deep cerebral haemorrhage

CASE 23568b
The patient, a 76-year old woman, was admitted to the hospital having been found lying upon the floor cold and unconscious, with gasping respirations. There was evidence of faecal and urinary incontinence and she had vomited. Physical examination on admission revealed an absence of any spontaneous movements but that she did respond to painful stimuli on both sides of the body. All limbs were hypertonic and both plantar responses were extensor. Both pupils were dilated and reacted equally. The blood pressure was 85/50 and the pulse rate was 104 per minute. The respirations were deep and sighing, with a prolonged expiratory phase and a respiratory rate of 32 breaths/minute. A lumbar puncture revealed xanthochromic fluid with 1700 red blood cells and 190 neutrophils per μL. The CSF was cultured but no organism was found. An ECG showed changes suggesting antero-lateral ischaemia. Biochemical investigations suggested dehydration. Her condition deteriorated and she died about a fortnight after admission.
The specimen consists of the lower half of the brain that has been sectioned in the transverse plane. The base of the brain demonstrates marked notching of the left uncus and parahippocampal gyrus. On the cut surface is a large dark brown well-demarcated lesion within the white matter of the left hemisphere. The midline structures are deviated to the right.
Diagnosis: Intracerebral haemorrhage with transtentorial herniation

CASE 23584
The patient was a previously well 53-year old woman who 3 weeks earlier had noticed some weakness of the right hand and arm, followed by right leg was weakness 2 days later. This weakness became steadily worse for 72 hours and then remained static until admission to hospital. She had not noticed any other symptoms. She was left-handed, although she normally used her right hand for many tasks.
On admission she was conscious, orientated and obviously upset by her disability. There was no abnormality in her cranial nerves and in her visual fields were normal. Apart from the presence of mild flexor activity in the right fingers there was a complete paralysis of the right upper limb. Power was reduced in the lower limb. The tendon reflexes were hyperactive on the right side and the right plantar reflex was equivocal. The tone was normal. The left side was normal. The patient continued to deteriorate and died thirteen weeks later.
The specimen consists of a coronal slice of the cerebral hemispheres. There is a large, poorly defined lesion within the left parietal lobe that extends across the corpus callosum to the right parietal lobe. The lesion is cream to pale grey in colour with areas of cystic degeneration and haemorrhage. The lateral ventricles are severely compressed.
Diagnosis: Astrocytoma (confirmed histologically) in cerebral hemispheres

CASE 23600
The patient was a woman aged 27 at her death. She had a complicated psychiatric and organic history beginning 3 years earlier with weight loss and amenorrhoea after a miscarriage. Initially the obstetrician regarded the illness as an organic depression, but then considered abnormal pituitary function. Six months later a second consultant obstetrician regarded her illness as psychogenic. At that time the only biochemical abnormality was a low total thyroxine. Skull x-ray was normal. After a further 6 months her vision was apparently affected though the fundi and optic discs were reported as normal. A psychiatrist considered the condition to be anorexia nervosa and another obstetrician favoured Chiari-Frommel syndrome (persistent post-partum lactation and amenorrhoea, due to excess prolactin). On her final admission there was frontal

headache, weight loss, blindness, amenorrhoea, drowsiness, and difficulty in walking. The pupils were small and fixed, the eyes were deviated downwards and there was a right abducens paralysis with mild left hemiparesis. There was bilateral optic atrophy and absence of ciliary reflexes. Brain scan showed a lesion in the midline in front of the 3rd ventricle. Craniotomy was performed and some contents of a cystic tumour were aspirated. She died shortly afterwards.

The specimen is a sagittal slice of the left cerebral hemisphere including the brainstem and cerebellum. A round well-demarcated lesion 45mm in diameter is present within the region of the hypothalamus. The lesion is pale cream to tan with areas of haemorrhage and cystic degeneration. It has compressed the 3rd ventricle and possibly infiltrated the optic chiasm and on the back of the specimen the lateral ventricle appears slightly enlarged.

Diagnosis and comment: The lesion is obviously a tumour. Possibilities in this suprasellar/hypothalamic region include craniopharyngioma, upward extension of a pituitary tumour, meningioma, gliomas of the hypothalamus, malignant lymphoma, metastases and extension of an adjacent chordoma. The macroscopic features are against astrocytoma. Histology revealed the diagnosis to be craniopharyngioma.

CASE 23656

The patient was a 77 year old man who was an inmate of a mental hospital because of dementia. Two days earlier he had collapsed. His BP was 110/70, pulse rate was 150/minute and irregular. He was restless and confused. Investigations showed severe pulmonary oedema. His condition steadily deteriorated and he died.

The specimen consists of a coronal slice of the cerebral hemispheres. Within the region of the right basal ganglia is an area 30 x 20mm of dark brown to grey mottling. The lesion has relatively well-defined margins and appears swollen, compressing the right lateral ventricle.

Diagnosis: Haemorrhagic infarction of right basal ganglia

CASE 23726

The patient was a woman aged 53 who had been tired and unable to concentrate for several months. In the last 2 months she had 3 minor car crashes, in each case colliding with a stationary vehicle on her left side. Over the past 6 weeks she had developed a left hemiplegia and mental sluggishness. On examination she was obtunded and ignored the left side. There was paresis of voluntary and involuntary conjugate gaze to the left. The fundi were normal. There was a left homonymous hemianopia and a severe left hemiparesis involving face, arm and leg. There was moderate left sensory defect, reflexes on the left were increased and both toes were upgoing. A burrhole biopsy was performed and 30ml of greenish-yellow fluid were aspirated. She died a few weeks later.

Without looking at the specimen, on the basis of her symptoms where would you expect the lesion to be? Right parietal lobe

The specimen is a coronal slice through the cerebral hemispheres. Within the right parietal lobe is a cream to grey mostly well-demarcated 50x35mm lesion with focal areas of haemorrhage and necrosis and a large area of cystic degeneration. The cavity of the right lateral ventricle is compressed and the septum pellucidum is deviated to the left.

Diagnosis: Glioblastoma multiforme in right cerebral hemisphere

CASE 23821

A man of 57 presented in January 1972. He had suffered from progressive difficulty in swallowing since May 1971 with aspiration of fluids into the trachea. Over the past 6 months he had developed severe occipital headaches and shortness of breath.

On examination he was grossly ataxic with intermittent vertical and lateral nystagmus. The tongue deviated slightly to the right. The cough was weak and the voice husky. There were bilateral 6th nerve pareses most marked on the left, with bilaterally brisk reflexes and upgoing plantar reflexes. Pre-mortem vertebral

angiography showed an aneurysm arising from the left vertebral artery. Suboccipital craniotomy was performed but removal was impossible. The patient died shortly afterwards.
The specimen consists of the brain stem and cerebellum divided in the transverse plane at the ponto-midbrain junction and through the medulla. On the anterior surface of the specimen is a large round mass 35mm in diameter that indents the anterior surface of the lower pons and upper medulla, centred slightly to the left of the midline. The mass is clearly demarcated from the surrounding brain tissue and is dark brown in colour. The arteries do not appear severely atherosclerotic. There is patchy subarachnoid haemorrhage over the cerebellar hemispheres.
Diagnosis: Large aneurysm of the left vertebral artery
Comment: The haemorrhage may be surgical. The remaining vessels do not appear severely atherosclerotic so the aneurysm could be saccular or berry in type.

CASE 23825
This 25-year old woman presented with lassitude, a purpuric rash and blood loss PV. She also had episodes of haemoptysis and melaena. Examination showed hepatosplenomegaly, lymphadenopathy, and sternal tenderness. The white cell count was 49.0 x 10^9/L (4-12 x 10^9/L) with 93% myeloblasts. Terminally she developed aphonia, depressed consciousness, nystagmus to the left, a transient right facial tremor and a fixed dilated left pupil.
The specimen is a coronal section through the cerebral hemispheres. There are a number of discrete dark brown lesions throughout both cerebral hemispheres and basal ganglia. The largest is in the left parietal lobe and measures 45 x 30mm. There is a moderate amount of subarachnoid blood associated with it. The midline structures are deviated to the right.
Diagnosis: Cerebral haemorrhages secondary to acute myeloid leukaemia
How do you relate the pathological findings to the clinical history? In acute leukaemias (demonstrated here by elevated white cells with preponderance of blasts) the bone marrow is filled with neoplastic white cells that replace much of the normal cell population. As a result patients have anaemia, neutropenia and thrombocytopenia. Severe thrombocytopenia has resulted in spontaneous intracerebral haemorrhage. The haemorrhages have caused focal neurological disturbance and raised intracranial pressure, the latter leading to left sided transtentorial herniation with compression of the left oculomotor nerve leading to pupil dilatation.

CASE 23900
The patient was a 44-year old man who presented with a 3-month history of haemoptysis, dyspnoea and weight loss. Three days before admission he had a sudden onset of left-sided weakness, dysphagia, dysphasia and right parietal headache. On examination he had the clinical signs of pneumonia and a left hemiparesis and hemianaesthesia.
The specimen shows the lower half of the brain. The brain is swollen. The meninges over the optic chiasm and anterior surface of the brainstem and cerebellum appear opaque. On the cut surface of the specimen is a well-defined area of yellow grey necrosis 25x20mm in the right thalamus that compresses the third ventricle.
Diagnosis: Suppurative meningitis and cerebral abscess
Comment: Autopsy also revealed a carcinoma in the left lung.

CASE 23952
This 54-year old was admitted with acute pancreatitis. Over the last few months however he also had had tiredness, headaches, neck pains and depression. On examination he was confused and disorientated with receptive and expressive dysphasia, bilateral grasp reflexes and a left grope reflex. There was generalised hyperreflexia and a probable extensor right plantar reflex. The presence of a right visual field defect was suspected. Other findings included a blood pressure of 190/150 and epigastric tenderness. He died in ventricular fibrillation soon after admission.

The specimen is a coronal section through the cerebral hemispheres. Within the 3rd ventricle is a cystic lesion 15mm in maximal diameter, with thin pale walls and filled with grey gelatinous material. The lesion distends the septum pellucidum and is blocking the foramina of Munro to produce dilatation of both lateral ventricles.
Diagnosis: Colloid cyst of the third ventricle

CASE 24067
The patient was a man 54 who presented with episodes of pathological drowsiness and progressive failure of memory. There were no objective neurological signs on examination and skull x-rays were normal. Air encephalogram showed failure of filling of the right lateral ventricle and dilatation of the left lateral ventricle with obliteration of the anterior two-thirds of the 3rd ventricle. Because the lesion appeared to be obstructing the right foramen of Munro, bilateral ventriculo-spinal shunts were performed, with subjective improvement. Biopsy attempted during this first admission obtained no tissue but fluid containing cholesterol crystals was recovered. The ventriculo-spinal shunt was later revised to a ventriculo-atrial shunt. He next presented 3 months later with a transient right homonymous hemianopia followed by a focal fit that left him with a left hemiplegia and deviation of the eyes to the left. Later a right hemiparesis and right hemianopia were recorded. Fits became more frequent until they merged into almost continuous status epilepticus, and he died from bronchopneumonia.
The specimen consists of a sagittal slice of the right side of the brain including the brainstem and cerebellum. There is an irregular lesion in the region of the hypothalamus, between the optic chiasm and the mamillary body. The lesion is 22mm in diameter and is cystic, partly lined by yellow granular material. The reverse of the specimen shows the track of the catheter from near the occipital pole to the posterior horn of the lateral ventricle.
Diagnosis and comment: The lesion is obviously a tumour. Possible tumours in this suprasellar/hypothalamic location in adults include upward extension of a pituitary tumour, meningioma, astrocytoma, craniopharyngioma, malignant lymphoma, metastases and extension of an adjacent chordoma. The cystic nature of the tumour excludes many of these diagnoses. Histology revealed the lesion to be a craniopharyngioma. The presence of cholesterol crystals (developing from cellular debris) on the aspirate is strongly suggestive of this diagnosis.

CASE 24145
The patient was a 49-year old man with a long history of tuberculosis that was being treated with streptomycin, para-aminosalicyclic acid and isoniazid before his final admission. On that admission he had pancytopenia and he died suddenly during blood transfusion.
The specimen is a transverse section of the cerebellum and brainstem. There is a large, well-demarcated dark brown lesion within the right cerebellar hemisphere that measures 50 x 35mm. The right dentate nucleus is displaced to the left and there is compression of the 4th ventricle. There is a small amount of subarachnoid blood on the surface of the cerebellum and marked bilateral cerebellar tonsillar grooving.
Diagnosis: Cerebellar haemorrhage with tonsillar herniation
How do you relate the pathological findings to the clinical history? The patient was pancytopaenic, quite possibly caused by one his medications, and this would include thrombocytopenia; thus he was at increased risk for spontaneous intracerebral haemorrhage. The cerebellar haemorrhage has acted as a space occupying lesion and caused a rapid increase in pressure in the posterior fossa leading to tonsillar herniation causing compression of the respiratory centre in the medulla and rapid death.

CASE 24171
The patient was a 73-year old man who presented in June 1972 with malaise, palpitations and breathlessness. Investigations revealed a haemoglobin of 69g/L (130-180g/L) a white cell count of 0.43 x 10^9/L (4-12 x 10^9/L) and platelets of 18 x 10^9/L (150-400 x 10^9/L). Bone marrow trephine showed myelofibrosis. He was admitted one month later with a sudden loss of consciousness and bilateral pyramidal tract signs. He died some hours later.
The specimen is a transverse section of the cerebellum and brainstem. There is a large, well-demarcated dark brown lesion within the left cerebellar hemisphere and left side of the pons that measures 44 x 30 mm. The lesion has ruptured into the cavity of the fourth ventricle.
Diagnosis: Cerebellar and pontine haemorrhage
How do you relate the pathological findings to the clinical history? In myelofibrosis the normal haemopoietic marrow is replaced by fibrous tissue resulting in pancytopenia, naturally including thrombocytopenia, which predisposes to intracerebral haemorrhage.

CASE 24227
This 74-year old woman had hypertension for many years and became unconscious after becoming confused and complaining of a right parietal headache. Her BP was 180/120 and she had a right hemiparesis and right facial weakness, slight neck stiffness and deep cupping of the optic discs. She died two days after admission.
The specimen consists of two transverse sections of the cerebellum and brainstem. There is a well-demarcated dark brown lesion present posteriorly in the cerebellum extending laterally into the white matter of both cerebellar hemispheres. There is bilateral cerebellar tonsillar grooving.
Diagnosis: Cerebellar haemorrhage with tonsillar herniation

CASE 24324
This 69-year old man was admitted to hospital after a sudden onset of confusion with a speech impediment. Examination revealed an expressive dysphasia with dysarthria, and a right hemiparesis and hemianaesthesia. Two days after admission his state of consciousness deteriorated and he died one week later.
The specimen consists of two coronal slices through the cerebral hemispheres. They are viewed from the front and show a well-demarcated 25mm dark brown lesion in the region of the left thalamus and internal capsule. The cavities of the adjacent lateral and third ventricles are compressed. In addition there is a cavity measuring 20 x 15mm in the region of the right putamen, with smooth orange-brown walls.
Diagnosis: Recent and old intracerebral capsular haemorrhages
Comment: The cavity with haemosiderin stained walls represents an old haemorrhage.

CASE 24371
This 62-year old woman presented with a 2-year history of personality change and gradual dysphagia. On examination she was confused, with a poor attention span, nominal aphasia, bilateral grasp reflexes, biphasic plantar responses and a right homonymous hemianopia, while muscle power and sensation were unaffected.
A brain scan indicated a left-sided lesion. A biopsy was performed but she died soon afterwards.
The specimen consists of 2 coronal sections through the cerebral hemispheres, viewed from the front. Within the left temporal lobe is a large, yellow-grey lesion 40 x 55mm with ill-defined margins and areas of haemorrhage, cystic degeneration and necrosis. The cavity of the left lateral ventricle is compressed and there is midline deviation. There is marked herniation of the left parahippocampal gyrus with compression and haemorrhage in the midbrain (bottom of pot) and there has been herniation of the left cingulate gyrus beneath the falx.
Diagnosis: Glioblastoma multiforme of left temporal lobe with transtentorial herniation

CASE 24380
This 44-year old deaf mute woman died after a grand mal seizure. She was being investigated for 3 months of neurological symptoms. She had had epileptiform seizures since cranial injury from a fall when two.
The specimen consists of a transverse slice through the cerebellum and brainstem. There is a lesion in the posterior aspect of the left lobe of the cerebellum that measures 25 x 15mm. It is clearly demarcated from the surrounding brain tissue and has a variegated appearance with areas of grey, orange brown and dark brown. The overlying cerebellar surface is sunken and the fourth ventricle compressed slightly.
Diagnosis and comment: Histology reportedly showed this cerebellar lesion to be a vascular malformation. The orange staining is haemosiderin from old bleeding.

CASE 24390
This 61-year old man had a history of 6 weeks of tiredness, 4 weeks of sensory loss and clumsiness of the left hand and 3 weeks of drooping left face and dragging left leg. He had bilateral papilloedema and a left homonymous hemianopia. He deteriorated rapidly and died.
The specimen consists of two coronal sections through the cerebral hemispheres viewed from behind. Within the right parietal lobe is a large, well-defined round lesion, measuring 50 x 35mm. The cut surface is firm, heterogenous grey and fibrous, with no haemorrhage or frank necrosis. There is no apparent connection to the meninges or ventricle. There is compression of the right lateral ventricle, subfalcine herniation and deviation of the septum pellucidum to the left.
Diagnosis: Intracerebral meningioma (confirmed histologically) with subfalcine herniation
Comment: Meningiomas usually arise from arachnoidal cells of the meninges and rarely in the ventricles. This tumour seems to have no connection with either.

CASE 24398
This 59-year old man had a 12-month history of sore throat and difficulty in swallowing with haemoptysis. Pharyngoscopy and biopsy demonstrated a squamous cell carcinoma. He died after rapidly deteriorating while being treated with radiotherapy and chemotherapy.
The specimen consists of a section of dura and a portion of the overlying skull. Within the dura is a round lesion 35mm in maximal diameter. The lesion is well demarcated, finely nodular and pale in colour with no evidence of haemorrhage or necrosis. The specimen of skull shows an eroded area, where the lesion has extended into the overlying bone.
Diagnosis: Dural metastasis from carcinoma of the pharynx

CASE 24432
This 66-year old man had been well until the last few weeks of his life, when he had several episodes of severe frontal headache and vomiting. He then had an URTI that relapsed before he became and remained semiconscious over the next two weeks before his death.
The specimen consists of a transverse section through the brainstem and cerebellum. Within the right cerebellar hemisphere (left side of pot) is a poorly defined lesion 35 x 15mm composed of necrotic yellow material. There is oedema of the middle cerebellar peduncle anterior to the lesion and also compression and deformity of the 4th ventricle.
Diagnosis: Right cerebellar abscess (confirmed histologically)
Comment: The ears and sinuses were apparently not examined and there is no comment in the old catalogue as to the findings in the rest of the brain.

CASE 24433
The patient was a woman aged 74 who had ataxia to the left for 4 years. It had become increasingly severe during the 6 months preceding admission. There was no tinnitus, giddiness, vertigo or deafness. There were no arterial murmurs in the neck and the BP was the same in both arms. There was nystagmus to the right.

On admission to hospital there was also weakness of the right side and a speech disturbance, both apparently of recent onset. These symptoms progressed and two weeks later she was severely hemiplegic and aphasic, with a right homonymous hemianopia and right hemianaesthesia. Brain scan and left carotid arteriogram demonstrated a left temporo-parietal lesion. She died 2 weeks later.
The specimen is a coronal section through the cerebral hemispheres. Within the left parietal lobe (right side of pot) is a large cream and grey lesion measuring 50 x 40mm. The lesion has poorly defined margins and areas of cystic degeneration. There is compression of the left lateral ventricle and deviation of the septum pellucidum to the right. There is also moderate subfalcine herniation of the left cingulate gyrus.
Diagnosis: Astrocytoma (confirmed histologically) in left cerebral hemisphere

CASE 24437
The patient was a man aged 48 who was admitted from a country hospital. The illness began with sudden severe headache while bending over in the shower the previous night. He collapsed but later walked to the local hospital where he was admitted. Next morning there was numbness and weakness of the left side but no neck stiffness or photophobia. He had a previous similar episode 12 years ago. On admission to the RAH there was left hemiplegia, the BP was 190/150 and the CSF was clear with a pressure of 170mm (N 70-180mm). He improved for the first 16 hours but then had a sudden respiratory arrest and quickly developed fixed dilated pupils. He was maintained on a respirator for a further 20 hours before being certified dead.
The specimen consists of a transverse slice through the brain stem and cerebellum. On the anterior surface of the medulla (best seen through the top of the pot) is a round dark brown lesion 20mm in diameter that appears to arise from the basilar artery. There is minimal atherosclerosis. Patchy subarachnoid haemorrhage is present over the base of the cerebellar hemispheres and there is blood in the fourth ventricle.
Diagnosis: Ruptured basilar artery saccular (berry) aneurysm with subarachnoid haemorrhage

CASE 24442
This 49-year old man had a history of hypertension for which he had refused treatment. On this occasion he presented with a right hemiparesis involving arm and leg and his BP was 250/145. He died after 2 days in hospital.
The specimen is a coronal section through the cerebral hemispheres. There is a well-demarcated dark brown lesion within the region of the left thalamus, basal ganglia and internal capsule. It has ruptured into the left lateral ventricle. The septum pellucidum is torn and deviated to the right. On the back of the specimen is a separate discoloured slit-like 15mm long lesion in the left putamen and external capsule, possibly representing the site of an old haemorrhage.
Diagnosis: Intracerebral capsular or deep cerebral haemorrhage with rupture into ventricular system

CASE 24447
The patient was a man aged 31. His history extended over 12 years and began with grand mal seizures, often followed by periods of automatic behaviour and always followed by a Todd's paralysis involving the right arm and the right leg, lasting about 30 minutes. These fits had been increasing in frequency and after 4 years occurred about 2 or 3 times a week. At the time of his initial presentation he had been investigated and a diagnosis of tuberous sclerosis was made. Eight months before his death there was progressive intellectual deterioration with episodes of violent behaviour. There was also bilateral weakness in the legs. He became progressively emaciated and died.
What is Todd's paralysis? This is the phenomenon of localised paralysis, lasting minutes to hours following an epileptic seizure.
What is tuberous sclerosis? Tuberous sclerosis is an autosomal dominant disease characterised by seizures; a variety of different skin lesions and various benign tumours and hamartomas of the retina; heart; kidney; bone; spleen and liver. The most characteristic feature in the brain is the presence of pale firm

nodules in the cerebral cortex that may be single or multiple. Nodules are also present on the walls of the lateral ventricles.
Patients suffer from varying degrees of epilepsy and mental retardation, and are at risk for obstructive hydrocephalus and development of various tumours such as ependymomas and astrocytomas. Life expectancy in severe cases is 30 years.
The specimen consists of a coronal section through the cerebral hemispheres. The corpus callosum is abnormally wide and grey. This grey tissue extends down the sides of the lateral ventricles. On the back of the specimen the corpus callosum can be seen to contain a poorly defined grey mass 40 x 10mm, with a nodular component extending into the septum pellucidum. The lesion contains congested vessels and foci of petechial haemorrhage but no definite necrosis. The foramina of Monro are obstructed. Blood clot is present in the left lateral ventricle.
Diagnosis: Astrocytoma (confirmed histologically) of corpus callosum and septum pellucidum
How do you relate the pathological findings to the clinical history? The initial seizures are in keeping with a diagnosis of tuberous sclerosis. The development of progressive intellectual deterioration and leg weakness is due to the development of the tumour.

CASE 24575
This 75-year old man with dementia was admitted with dehydration and pneumonia. He developed renal failure and died 16 days later.
The specimen is a coronal slice through the cerebral hemispheres. A large pale 25 x 40mm mass can be seen between the frontal lobes inferiorly. It compresses but does not invade the adjacent brain. It has a homogenous fleshy appearance with no evidence of haemorrhage or necrosis.
Diagnosis: Olfactory groove meningioma (confirmed histologically)

CASE 24614 A and B
The patient was a man aged 24 who was a rear seat passenger in a car that collided with a bus. On admission he was deeply unconscious and there was an extensive fracture of the left fronto-temporal region. Necrotic brain tissue was extruding from the nose. Craniotomy showed extensive cerebral contusions. He remained unconscious for 6 weeks and then gradually improved until he could walk with assistance, was able to feed himself, and to communicate by nods and gestures. He then became drowsy, with mild fever that did not respond to treatment. His condition slowly deteriorated and he died 5 months after the accident.
The specimen is preserved in two jars.
Specimen A is a transverse section through the cerebral hemispheres. The brain is markedly distorted. There is atrophy and focal red brown staining of the left frontal lobe. The cortex and white matter elsewhere do not appear atrophied. The anterior part of the left lateral ventricle is compressed and distorted. The right lateral ventricle is grossly dilated and distorted and is lined by pale grey exudate. On the base of the specimen, the extent of the old injury to the left frontal lobe is apparent. The aqueduct is also filled with pale grey exudate. The meninges appear clear.
Specimen B consists of two transverse sections of the brainstem and cerebellum. The fourth ventricle is greatly dilated and lined by the same thick pale grey exudate seen in the ventricular system in specimen A. A thin congested rim of tissue surrounds the dilated ventricle. Pale exudate is also present over the surface of the pons and medulla.
Diagnosis:
Specimen A: Septic ventriculitis with old traumatic brain injury
Specimen B: Suppurative meningitis and septic ventriculitis
How do you relate the pathological findings to the clinical history? The atrophy and red-brown staining of the left frontal lobe represents the resolving traumatic brain injury with contusion. However gradual improvement was followed by drowsiness and mild fever that suggest infection. Bacteria may have gained

access to the meninges and ventricles either via the skull fracture or as a result of some invasive medical procedure.

CASE 24636

The patient was a man aged 42. At age 30 he was investigated for fits involving the right side. EEG suggested a right parieto-occipital abnormality. Eight years later he presented with a 6 month history of headaches and drowsiness. He was found to be moderately demented with bilateral papilloedema, left homonymous hemianopia, left ptosis, left facial weakness and slight weakness of the left arm and leg with brisk tendon reflexes. Skull x-ray showed intracranial calcification in the right frontal region. Craniotomy with internal decompression of a tumour was performed and a course of radiotherapy was given. The left hemiparesis and left homonymous hemianopia resolved and he remained well apart from focal fits involving the left eye.

At his last admission he had been ataxic for 3 weeks and on examination the left homonymous hemianopia had recurred and there was a left sensory and motor hemiparesis and truncal ataxia. He was managed conservatively and died after 8 months of gradual deterioration.

The specimen is a coronal slice through the cerebral hemispheres with a portion of overlying dura. Within the right parietal lobe (left side of pot) is a large poorly defined mass that extends down through the right thalamus and the septum pellucidum into the midbrain. The lesion has cavitated and there are areas of haemorrhage. Both lateral ventricles are dilated and the septum pellucidum is deviated markedly to the left. Several black silk surgical sutures are still in place in the portion of thickened dura mater.

Diagnosis and comment: The lesion is obviously a tumour. It does not have the typical spongy/haemorrhagic appearance of an AV malformation. In an adult the commoner tumours of the cerebral hemispheres include astrocytoma; glioblastoma multiforme; metastatic carcinoma; oligodendroglioma; ependymoma and malignant lymphoma. In this case the poorly defined nature of the lesion is against it being a metastasis and the long history is against it being a glioblastoma. Calcification is common in oligodendroglioma which is what it was reported as being.

CASE 24643

This 40-year old woman with a past history of hypertension was admitted after the sudden onset of unconsciousness. On examination her reflexes were brisk and symmetrical, with bilateral mild papilloedema. The CSF pressure was raised and the fluid was blood stained.

The specimen is a medial sagittal section through the right cerebral hemisphere, cerebellum and brainstem. In the midbrain and pons is a well-demarcated dark brown lesion measuring 50 x 25mm. Posteriorly the lesion extends into the tegmentum of the pons and bulges into the cavity of the 4th ventricle.

Diagnosis: Pontine haemorrhage

CASE 24657

The patient was a woman aged 58 who was admitted with a vague illness which included ulceration in the mouth followed by deterioration of consciousness. On admission she was flushed, the neck was stiff, there was a left homonymous hemianopia, paresis of voluntary conjugate gaze to the left and diminution of sensation on the left side. CSF: pressure 180mm of water (70-180), mononuclear cells 95, RBC 250, protein 0.22g/L (0.15-0.45g/L), glucose 3.1mmol/L (2.8-4.2mmol/L) and mild excess of globulin. A brain biopsy was performed and treatment initiated but she remained apathetic. Fits began on the 3rd hospital day, she developed bronchopneumonia on the 4th day and died on the 6th day.

The specimen is a coronal slice through the cerebral hemispheres. Within the right temporal lobe are numerous haemorrhages of varying size, ranging from petechial to 11mm. The haemorrhages are in both the white matter and the cortex. There is associated oedema of the white matter with midline deviation. Focal petechial haemorrhages are also seen in the left temporal lobe.

Diagnosis and comment: There are many causes of petechial haemorrhages (in addition to haemorrhagic infarction) in the CNS including:

- trauma: diffuse axonal injury; fat embolism
- infections: cerebral malaria; viral meningoencephalitis
- septicaemic shock
- bleeding disorders e.g. thrombotic thrombocytopenic purpura; DIC
- hypertensive encephalopathy
- allergic hypersensitivity

In this case the distribution of haemorrhages in the left temporal lobe is strongly suggestive of *Herpes simplex* encephalitis and this was confirmed on histology.
HSV-1 encephalitis is one of the most common forms of viral encephalitis. It is an acute fulminating disease and without treatment has a mortality rate of 70%, with only 12% of patients surviving to any form of independent existence. With acyclovir, the mortality rate has dropped to around 20% but 42% of survivors have serious handicap requiring continuous supportive care. Only about 25% of patients have a history of cold sores.

CASE 24665
This 60-year old woman was found at home in a semicomatose state. She was a known hypertensive with a history of left temporal headache and eye pain. Examination showed a subhyaloid haemorrhage, right hemianopia, facial weakness and hypotonia. She died nine days after admission.
The specimen is a transverse section through the cerebral hemispheres. At the antero-medial end of the left temporal lobe is a well-demarcated, round encapsulated lesion containing blood clot that is 35mm in diameter. It arises from the left middle cerebral artery and projects laterally into the white matter of the left temporal lobe. Some recent subarachnoid bleeding is visible on the lateral aspect of the hemisphere.
Diagnosis: Large saccular (berry) aneurysm of the left middle cerebral artery with subarachnoid haemorrhage

CASE 24751
This 62-year old woman was found deeply comatose at home. She regained consciousness after 12 hours, but complained of severe constant frontal headache and blurring of vision. Her blood pressure was 175/100mmHg. There was a left sided sixth nerve palsy and she had a stiff neck. Lumbar puncture produced xanthochromic fluid. Her initial progress was satisfactory until 11 days later when there was a further reduction in consciousness. She gradually improved but six days later there was a third episode of loss of consciousness. On examination she was found to have papilloedema and hypertonia with hyperreflexia of the right arm. The patient died a few days later.
The specimen consists of the lower half of the brain divided in the transverse plane. The vessels of the circle of Willis are grossly atherosclerotic and tortuous. An aneurysm 1cm in diameter arises from the junction of the right middle cerebral and right posterior communicating arteries (difficult to see). There is a further aneurysm 1cm in diameter on the trunk of the right middle cerebral artery 3cm from its origin. There is a small amount of recent subarachnoid blood around the base of the brain.
Diagnosis: Berry (saccular) aneurysms of circle of Willis
Comment: The aneurysm at the junction of the right middle cerebral and posterior communicating arteries was seen to have ruptured at post-mortem, but most of the blood was washed away.

CASE 24770 a and b
This 75-year old woman with a history of hypertension was admitted after being found unconscious. On examination, the eyes were deviated to the right and she had a flaccid left hemiparesis with left extensor plantar response. Her BP was 200/120 mm Hg. She died two days after admission.
There are 2 specimens.
Specimen a contains the lower half of the hemispheres divided in the transverse plane. There is marked notching with early necrosis of the right uncus and parahippocampal gyrus. The right posterior cerebral

artery runs in a deep groove between the herniation and the peduncle and has been kinked against the edge of the tentorium.
On the cut surface of the specimen the right hemisphere is swollen and the midline structures are deviated considerably to the left. In the vascular territory of the right middle cerebral artery is a foal area of haemorrhagic discolouration in the cortex. The dividing line between cortex and white matter is not blurred. In the right posterior cerebral artery territory there is extensive haemorrhagic discolouration of the cortex and swelling with blurring of the border between cortex and white matter.
Specimen b consists of the superior half of the cerebral hemispheres and a portion of the frontal bone. The bone shows marked irregular thickening of the bone with compression of the superior and lateral surfaces of both frontal poles.
On the cut surface the infarcts in the right middle and posterior cerebral artery vascular territories are visible.
Diagnosis:
Specimen a: Right middle cerebral artery infarction with transtentorial herniation causing compression of the right posterior cerebral artery with infarction
Specimen b: As for specimen a, also hyperostosis frontalis interna
How do you relate the pathological findings to the clinical history? The hyperostosis is incidental. The initial lesion would have been the right middle cerebral artery infarction leading to the loss of consciousness, eye deviation, left hemiparesis and left extensor plantar response. The infarct has caused marked oedema and the subsequently raised intracranial pressure has lead to transtentorial herniation as demonstrated by the marked notching of the left uncus and parahippocampal gyrus. The right posterior cerebral artery has been compressed in the herniation resulting in a right posterior cerebral artery infarct, typically haemorrhagic in this circumstance. Hypertension would have placed the patient at increased risk of cerebral infarction by predisposing to atherosclerosis for example.

CASE 24790
The patient was a woman aged 65 who had had two subarachnoid haemorrhages in the past. At operation for the second episode, two years before her death, an aneurysm of the anterior communicating artery was tamponaded. A haematoma in the right frontal lobe was noted at that time. She remained moderately well thereafter but with some disability, until one day she lost consciousness suddenly and died a day later.
The specimen is of the lower half of the brain divided in the transverse plane. Between the frontal lobes is an encapsulated lesion 45mm in diameter, which contains layers of pale and dark brown material. There is old brown-stained traumatic disruption of the right frontal lobe and a slight amount of similar old damage in the left frontal lobe. The base of the brain shows the inferior aspect of the lesion, partially stained red brown. The lesion arises from the anterior communicating artery. There is minimal atherosclerosis. There is patchy recent subarachnoid blood over the anterior surface of the pons, around the cerebellum and in the cavities of the 4th and left lateral ventricles.
Diagnosis: Large saccular aneurysm of the anterior communicating artery containing laminated thrombus, also with subarachnoid haemorrhage and old traumatic brain damage
Comment: The aneurysm has presumably ruptured leading to the subarachnoid haemorrhage. The red brown staining represents haemosiderin from old haemorrhage.

CASE 24870
This 67-year old man had a left acoustic neuroma incompletely removed 12 years previously. He had a residual left facial weakness. In the ten days before admission he developed an increased speech defect and became disorientated with incontinence of urine and of faeces.
The specimen consists of a transverse section through the cerebellum and brain stem. There is a large well-demarcated mass external to but compressing the left side of the pons. The mass measures 45 x 20mm and on its cut surface it has a variegated appearance, ranging in colour from yellow to grey and tan.

There is no evidence of necrosis. The lumen of the 4th ventricle is pushed to the right and is compressed to a slit.
Diagnosis: Acoustic neuroma (confirmed histologically)
Comment: A reasonable differential diagnosis would be meningioma.
At autopsy there were two sessile neurofibromas 2cm in diameter over the sternum and buttock and a few small neurofibromas in the cauda equina. This patient may have had one of the forms of neurofibromatosis.
Why might this patient have had a left facial weakness? The neuroma itself may have arisen on the facial nerve or the nerve may have been damaged in the previous surgery.

CASE 24892
This 59 year old woman was admitted to hospital complaining of sudden onset of slurred speech and pain over the right eye.
On examination in hospital she had left upper motor neurone facial weakness and flaccid paralysis of both her left arm and left leg. Sensation was absent from the left leg and to a lesser extent from the left arm. Her eyes were deviated to the right. She died from pneumonia on the 7th hospital day.
The specimen is a coronal slice through the cerebral hemispheres.
There is a focal lesion within the right thalamus. It is dark brown in colour and round with well-demarcated borders and a solid appearance. The cavities of the third and right lateral ventricles are compressed and the lesion has ruptured into the lateral ventricle through the caudate nucleus. There is slight midline shift to the left.
Diagnosis: Right capsular or deep cerebral intracerebral haemorrhage

CASE 24931
This 21-year old woman had a two week history of spontaneous bruising. A blood picture showed a WCC of 80 x 10^9/L (4-12 x 10^9/L), mainly blasts cells, haemoglobin 86g/L (115-165g/L) and a platelet count of 26 x 10^9/L (150-400 x 10^9/L). There was no lymphadenopathy or hepatosplenomegaly. On the third day after admission she was found unconscious, with a fixed dilated left pupil. Reflexes were symmetrical, but there was an extensor left plantar response. She died shortly afterwards.
The specimen consists of two coronal slices through the cerebral hemispheres. Within the left frontal white matter is an irregularly shaped dark brown lesion measuring 45 x 40mm. There is swelling of the left hemisphere and midline shift. There is also evidence of recent subarachnoid haemorrhage.
Diagnosis: Spontaneous intracerebral haemorrhage in acute leukaemia
How do you relate the pathological findings to the clinical history? In acute leukaemias (demonstrated here by elevated white cells with preponderance of blasts) the bone marrow is filled with neoplastic white cells that replace much of the normal cell population. As a result patients have anaemia, neutropenia and thrombocytopenia. Severe thrombocytopenia has resulted in spontaneous intracerebral haemorrhage. The haemorrhage has caused raised intracranial pressure, leading to left sided transtentorial herniation with compression of the left oculomotor nerve leading to pupil dilatation and compression of the contralateral cerebral peduncle leading to an extensor left plantar response.

CASE 24995
A 55-year old man gave a history of 3 months general malaise, headaches and more recently mental confusion and incontinence. Six months earlier he had lost his executive job. On examination he was markedly disorientated but could answer questions. He was unperturbed by his urinary incontinence. There was intermittent twitching of the right arm and sometimes of the right leg, and mild paresis of upward gaze. There was mild right hemiparesis, strong bilateral grasp reflexes with weak groping and sucking reflexes. There was clonus of the right finger jerk and of both ankle jerks and bilateral extensor plantar responses. A left frontal burrhole biopsy was performed and a diagnosis made. Postoperatively he became increasingly drowsy with dilated sluggish right pupil and he died 11 days after the operation.

Without looking at the specimen, only on the basis of the patient's symptoms and signs, where would you expect the lesion to be?
The mental confusion, incontinence and the bilateral grasp and sucking reflexes indicate a frontal lobe lesion. The right-sided motor signs suggest a lesion on the left side.
What is clonus? What is its significance? Clonus refers to the rapid, strong oscillating muscular contractions that occur when sustained tension is placed on one of the muscles around a joint such as a wrist or ankle. Although a few beats may be normal in an infant, the presence of clonus usually indicates a lack of the normal cortical inhibition of a deep tendon reflex.
The specimen is of two coronal slices through the cerebral hemispheres viewed from the front. There is a large rounded grey heterogenous, focally haemorrhagic and probably focally necrotic lesion 40mm in diameter in the region of the left thalamus and internal capsule. It has well-defined margins and has completely obliterated the lumen of the left lateral ventricle, the septum pellucidum is deviated markedly to the right and there is subfalcine herniation of the left cingulate gyrus. In the parasagittal region of the left frontal lobe there is disruption of the cortex with an ill-defined area 20mm in dimension of discolouration and swelling in the underlying white matter.
Diagnosis: Tumour in region of left thalamus/basal ganglia
Comment: Possible diagnoses include glioblastoma, ependymoma (arising from lateral ventricle) and metastasis.
At autopsy there were two further small tumours about 1cm in diameter in the left frontal lobe and a renal cell carcinoma 3cm in diameter was present in the left kidney. The brain tumours had a similar histological appearance to the renal tumour. These are thus metastases. The cortical disruption in the left frontal lobe is from the biopsy procedure. It is uncertain whether the abnormal area of white matter immediately beneath represents trauma or tumour. The autopsy report is not clear.

CASE 24997
This man had a nine-month history of acute myeloid leukaemia, treated with cytotoxic drugs. He was admitted with acute lower abdominal pain and signs suggestive of a perforated viscus. He was deeply unconscious with no response to painful stimuli. He died 3 hours after admission. At autopsy there was gas under pressure in the abdominal cavity, and a perforation of the caecum.
The specimen is a coronal section of the cerebral hemispheres.
There are extensive cystic spaces present throughout the central white matter and the basal ganglia. No other abnormality is present.
Diagnosis: Post-mortem gas formation

CASE 25001
This 64-year old woman was reported to be in good health until she "fainted" and was admitted to hospital, where she was found to be anaemic. While in hospital her mental state deteriorated and she died.
The specimen is a coronal section through the cerebral hemispheres viewed from the front. In the right frontal lobe is a large cavity 50x30mm with shaggy walls. It is surrounded by an ill-defined rim of patchily brown stained tissue. The right lateral ventricle is compressed, the septum pellucidum is deviated markedly to the left and the right cingulate gyrus has herniated beneath the falx.
Diagnosis and comment: This could be an abscess but at autopsy a large necrotic tumour was present in the left upper lobe of the lung. This cerebral tumour was solid at its anterior pole, there were two further small metastases in the occipital poles and histology showed carcinoma. This lesion is thus a metastasis.

CASE 25107
A man aged 69 sustained a head injury in a car crash in 1970. The period of post-traumatic amnesia lasted 24 hours. A few days later he complained of diplopia and right-sided numbness. There were no objective CNS signs except left-sided ptosis. For the next year indefinite symptoms involving the right side of the body continued. His last admission was at age 72 after a sudden collapse with loss of consciousness,

responding to painful stimuli only on the right side. BP was 190/120. The pupils were small and equal and not reacting to light. The right plantar response was extensor. There was a divergent squint. He remained unconscious and died of bronchopneumonia 5 days after the onset.
The specimen is a coronal slice through the cerebral hemispheres viewed from the back. There is a large dark brown to grey, friable lesion within the region of the left thalamus and internal capsule. The lesion has ruptured into the left lateral ventricle and the 3rd ventricle and the septum pellucidum is torn. There is no obvious evidence of old trauma in the specimen.
Diagnosis: Intracerebral capsular or deep cerebral haemorrhage with intraventricular rupture
Comment: This haemorrhage is recent and is unlikely to be related to the previous motor vehicle accident. The patient is hypertensive and the haemorrhage is in a classic site for hypertension related haemorrhage.

CASE 25110
The patient was a woman aged 76 who was admitted with chest pain and oliguria. There was no ECG evidence of myocardial infarction but pulmonary oedema was present. Tracheostomy was performed and she was maintained on intermittent positive pressure ventilation with haemodialysis and peritoneal dialysis for many days. She was repeatedly transfused. She died on the 17th hospital day. No CNS symptoms were present. The lesion was an incidental finding.
The specimen is a coronal sagittal slice through the right hemisphere including the brainstem and cerebellum. The gyral pattern is normal and there is no evidence of haemorrhage or atrophy. At the inferior aspect of the frontal lobe is a pale firm lobulated lesion 15mm in diameter. One small piece of tumour appears to be within the adjacent brain tissue. There is no evidence of haemorrhage or necrosis.
Diagnosis: Olfactory groove meningioma (confirmed histologically)
Comment: One small piece of tumour appears to be within brain tissue but at autopsy the tumour was said to be compressing but not invading brain. The tissue may have been displaced into the brain during sectioning.

CASE 25123
This 78-year old man was admitted with a 3 week history of progressive dementia. A malignant melanoma had been removed from the left ear two years previously. There were no localising neurological signs. He died after 2 weeks in hospital.
The specimen consists of two coronal slices through the cerebral hemispheres viewed from behind. There are multiple well-demarcated black lesions throughout both hemispheres. They range from 6 to 35mm in diameter.
Diagnosis: Metastatic malignant melanoma

CASE 25139
The patient was a woman aged 55 who presented with sudden occipital headache, vomiting and dizziness. There were no localising neurological signs but there was marked neck stiffness and the CSF was uniformly bloodstained. The BP was 210/95. Bilateral carotid angiograms 3 days after admission showed aneurysms of the right carotid bifurcation, right posterior communicating artery, and right and left middle cerebral arteries.
On the 6th day she developed a dense right homonymous hemianopia, right facio-brachial paresis and marked expressive dysphasia. She was treated with little effect.
During the next 22 days the left-sided weakness greatly improved but the dizziness remained unchanged. On the 31st hospital day while awaiting transfer to a rehabilitation unit she suddenly became deeply unconscious with fixed dilated pupils and died later that day.
The specimen consists of a coronal section through the cerebral hemispheres viewed from the front. Within the inferior portion of the vascular territory of the left middle cerebral artery there is some haemorrhagic discolouration of the cortex and swelling of the white matter causing midline deviation to the right. In the Sylvian fissure between the left temporal and frontal lobe is a 15mm slightly flattened aneurysm

on the left middle cerebral artery. It is surrounded by subarachnoid blood. The left uncus appears to be grooved.
Diagnosis: Ruptured berry (saccular) aneurysm of the left middle cerebral artery with subarachnoid haemorrhage and secondary left middle cerebral artery territory infarction
Correlate the clinical features with the pathological features. The initial presentation with headache, vomiting, dizziness, neck stiffness and blood-stained CSF was due to subarachnoid haemorrhage from rupture of the aneurysm. The development and timing of the right homonymous hemianopia and dysphasia etc on the 6th day is in keeping with the development of the left middle cerebral artery territory infarction due to spasm of the artery caused by breakdown products of blood in the subarachnoid space. The cause of the deterioration on day 31 is uncertain. Cerebral oedema following infarction can cause raised ICP and herniation -> death but this usually occurs within a few days of the infarct. She may have had a subsequent bleed (which is common) leading to deterioration.

CASE 25157
A woman aged 50 with a history of glaucoma and hypertension suddenly complained that she felt "funny" and then began to talk nonsense. Later she was found seated on the toilet having vomited, and she complained of inability to see. On examination in the Emergency Department she was stuporose but responded to painful stimuli. In the ward she was unconscious and hyperventilating. The left pupil was larger than the right and both reacted poorly to light. There was right-sided hypertonia with increased reflexes and an extensor right plantar response. There were left-sided grope and grasp reflexes. The fundi were normal and there was no neck stiffness. She was treated conservatively, remaining unconscious until her death 6 days later from bronchopneumonia.
The specimen is the lower half of the hemispheres divided in the transverse plane. Within the white matter of the left parieto-occipital lobe is an irregular dark brown lesion measuring 75 x 65mm. It has well-demarcated margins but appears to have ruptured medially into the left lateral ventricle. The entire left hemisphere is expanded and the midline deviated to the right. The base of the brain (see back of specimen) shows marked notching of the left uncus and hippocampus.
Diagnosis: Large intracerebral haemorrhage with transtentorial herniation

CASE 25174
The patient was a woman aged 89 who collapsed at home. On admission she was semiconscious, unable to speak or to swallow. There was a right hemiplegia affecting face, arm and leg with increased reflexes and a right extensor plantar response.
She improved gradually for 2.5 weeks and then deteriorated rapidly over 24 hours and died.
The specimen is a coronal slice through the cerebral hemispheres viewed from behind. There is a well-demarcated lesion present in the white matter of the right hemisphere. The lesion measures 15mm in diameter and has a variegated appearance with colours ranging from yellow to dark brown. Two 5mm lacunae are noted in the right putamen. There is no definite evidence of recent or old infarction or intracerebral haemorrhage.
Diagnosis and comment: This lesion was reported as a vascular malformation in the autopsy report. The brown staining is in keeping with haemosiderin formation following previous bleeding. It would have been present for some time and in any case could not be responsible for the patient's presentation as it is on the wrong side. Recent ischaemic softening (found by palpation), in keeping with recent infarction of the left internal capsule and upper corpus striatum is reported in the autopsy report, although this is not readily appreciated macroscopically in the specimen. Histological examination was apparently not performed. The lacunae are old and typically occur in patient's with hypertension.

CASE 25207
This patient was a man aged 82 who had suffered a stroke 3 years previously, which was followed by choreiform movements of the right side. He was diabetic under treatment with oral hypoglycaemic agents. On his final presentation he was lethargic, dehydrated, drowsy, dysarthric and had hyperosmolia and hyperglycaemia. The diabetic crisis was controlled with difficulty, but his mental state did not improve. He had features of bulbar palsy and extensor plantar reflexes and he died after a month in hospital from pulmonary embolism.
What are choreiform movements? What is their significance?
Choreiform movements are a form of dyskinesia, and consist of rapid jerky, dance like movements (think choreography). They indicate a lesion in the striatum (caudate, putamen) or the substantia nigra.
The specimen consists of two coronal slices through the cerebral hemispheres viewed from the front. There is atrophy affecting the head of the left caudate nucleus and thalamus. There is thinning of the grey matter in the left middle cerebral artery territory with some discolouration of the underlying white matter. Small lacunae are noted in the left putamen and the remains of the left head of the caudate (back of pot). The right basal ganglia appear essentially normal.
Diagnosis: Ischaemic changes in the left basal ganglia and middle cerebral artery territory
Comment: Macroscopically the changes are at least weeks in age but there is no cystic change as typically develops over months–years in a large cerebral infarct. Histological examination of this area reportedly showed both old and more recent changes.

CASE 25223
The patient was a hypertensive woman of 67 who died from myocardial infarction complicated by myocardial rupture.
The specimen consists of the frontal poles seen from the front and a portion of dura including the falx. In the dura specimen a nodular mass can be seen arising from the left side of the falx. The mass is pale in colour and measures 20mm in diameter. Since it has not been cut, no comment can be made on the presence or absence of such features as haemorrhage or necrosis. The indentation made by the mass on the medial surface of the left frontal pole can be clearly seen.
Diagnosis: Meningioma of the falx

CASE 25232
The patient was a woman aged 86 who was found on the floor at home.
On admission she was semicomatose but then became very deeply unconscious and died on the 6th day. The BP initially was 180/100, the left pupil was contracted and weakly reactive. The eyes deviated to the left. There was weakness of the right face, right arm and right leg with bilateral upgoing toes.
The specimen consists of the lower half of the cerebral hemispheres divided in the transverse plane. Within the territory of the left middle cerebral artery there are extensive petechial haemorrhages within the cortex and underlying white matter. The hemisphere is swollen, the cavity of the left lateral ventricle is compressed and the septum pellucidum is deviated to the right. There is associated recent subarachnoid bleeding over the left lateral orbital gyri and above the left Sylvian fissure. There is no obvious grooving of the unci or parahippocampal gyri.
Diagnosis: Haemorrhagic left middle cerebral artery territory infarction

CASE 25233
The patient was a man aged 45 who presented 15 years earlier with diplopia, headaches and progressive left-sided visual failure. On examination there was bilateral papilloedema, left optic atrophy, vertical nystagmus on upward gaze and skew deviation of the eyes on lateral gaze. Ventriculogram showed obstruction of the aqueduct. A provisional diagnosis of glioma was made and radiotherapy was given after a ventriculo-cisternostomy had been performed. He remained very well for 10 years then developed twitching of the left arm, ataxia with falling to the left, blurring of vision and slurred speech. Vertebral angiogram

showed a large arterio-venous malformation of the upper brain stem, midbrain and adjacent portions of the basal ganglia. It was supplied bilaterally by branches of the cerebellar artery and possibly the choroid vessels, and drained posteriorly into the straight sinus by a large tortuous channel extending to the right of the midline. His condition steadily deteriorated with increasing ataxia, dysarthria and vertigo. His ventriculo-spinal shunt required revision and he was admitted to hospital but developed prolonged vomiting with aspiration after a ventriculogram. He died next day.
The specimen consists of two coronal slices through the cerebral hemispheres and upper brain stem viewed from behind. There is a well-defined dark brown lesion extending across the midline involving both thalami and third ventricle that extends down into the upper brainstem. Around the lesion, particularly in the right thalamus, prominent thin walled vessels of various sizes can be seen. There is marked dilatation of both lateral ventricles.
Diagnosis: Ruptured vascular malformation with intracerebral and intraventricular bleed and internal hydrocephalus
Comment: At autopsy there was a large amount of recent blood in the ventricular system.

CASE 25241
The patient was a man aged 55 who had chronic myeloid leukaemia for 5 years treated with chemotherapy. He subsequently developed bone marrow depression and required frequent transfusions of blood and platelets, but recently he had suffered an episode of gastrointestinal bleeding. At his last admission there was a generalised purpuric rash and he was comatose. He died 6 hours after admission.
The specimen consists of the lower half of the hemispheres, sectioned in the transverse plane. There is a recent haemorrhage in the white matter of the left frontal lobe with disruption of brain parenchyma. The left side of the corpus callosum is disrupted and there are scattered petechial haemorrhages within the remainder. There is a small amount of fresh blood in the lateral ventricles.
Diagnosis: Spontaneous intracerebral haemorrhage in leukaemia
Comment: Leukaemias themselves (due to marrow infiltration) or the treatment for them can cause bone marrow suppression with severe reduction in normal numbers of blood cells. Severe thrombocytopenia can lead to spontaneous bruising and bleeding.

CASE 25252
The patient was an 18-year old heavily tattooed motor cyclist who drove his machine into a car at high speed. He was admitted with severe head injuries and died after a few hours. At post-mortem considerable pulmonary aspiration was found and there was marked traumatic brain damage, particularly a laceration of the corpus callosum.
The specimen consists of the dura and falx opened to display the superior sagittal sinus and one transverse sinus. The sinuses are completely filled by thrombus.
Diagnosis: Antemortem thrombus in sagittal sinus and transverse sinus

CASE 25267
No clinical information is available for this specimen.
The specimen shows the lower half of the brain. Within the right cerebellopontine angle is a rounded pale mass measuring 40 x 30 x 30mm. It appears external to the brain, is well circumscribed, possibly encapsulated, and has extensively compressed the right side of the pons. It arises above the level of the 8th nerve that can be seen in its normal situation and appears normal. The reverse of the specimen shows slight dilatation of the 3rd ventricle but the lateral ventricles appear normal.
Diagnosis and comment: The main differential diagnosis on the basis of the macroscopic appearance would be either a schwannoma or a meningioma. On section there was reported cystic change and haemorrhage but histology was inconclusive.

CASE 25274

This patient was a woman aged 49 with a 7 year history of hypertension, who was admitted with a history of numbness and weakness on the left side of the body associated with headache. The BP was 220/145. Brain scan showed reduced perfusion of the right hemisphere compared with the left and the appearances were considered consistent with cerebral vascular disease. A week after admission she was able to move all limbs though there was slight residual weakness on the left side. Four days later a sudden dense left hemiplegia occurred with a fever of 39.5°C. The pupils were small and equal. She died 3 days later.

The specimen consists of a transverse slice through the pons and cerebellum. There is a single well-demarcated dark brown lesion in the posterior aspect of the pons, predominantly on the right but extending across to the left side, which measures 27 x 10mm.

Diagnosis: Pontine haemorrhage

Comment: At post-mortem no abnormalities were found to account for the left sided weakness for which she was admitted initially. It could have been caused by a small pontine infarct or haemorrhage that was obliterated by the large haemorrhage occurring 11 days later.

CASE 25280

The patient was a man aged 46 who first came to medical attention when he was knocked unconscious in a brawl. While waiting to be seen in the Emergency Department he had a grand mal seizure. A skull x-ray showed a linear fracture in the left temporo-parietal area and he was admitted to hospital for observation. During this time he was noted to be dysphasic and disorientated, with a very poor memory. More careful examination found mild right lower facial weakness and weakness of grip in the right hand.

Further imaging suggested an intracerebral haematoma and exploratory surgery was performed. A biopsy was taken at that time.

Post-operatively the patient became aggressive and hostile and had to be detained to a mental hospital under certification. There his condition deteriorated with dyspraxia, right homonymous hemianopia and right facial weakness. Terminally he was transferred back to the RAH where he died, a year after his first presentation.

The specimen consists of the cerebral hemispheres sectioned in the transverse plane. There is a poorly defined mass with infiltrating margins within the white matter of the left temporo-parietal region. It is about 60mm in diameter with areas of haemorrhage and necrosis. There is surrounding oedema with compression of the left lateral ventricle and midline deviation to the right. The tumour extends through the splenium of the corpus callosum, into the septum pellucidum and into the left uncus and hippocampus that are markedly notched from herniation. There is haemorrhage and necrosis in the posterior pons. There is old brown stained superficial cortical damage affecting the inferior and lateral surfaces of the right temporal pole and the right orbital gyri.

Diagnosis: Astrocytoma (confirmed histologically) with transtentorial herniation

CASE 25284

The patient was a woman aged 44 who presented 5 weeks before her death with a 12 month history of seizures. Initial skull x-ray and EEG were negative, however, subsequent brain scan showed evidence of a space-occupying lesion in the right frontal lobe. Pneumoencephalogram revealed displacement of the ventricular system to the left, with occlusion of the right foramen of Monro. The lesion was considered to be a slow growing glioma and biopsy would have been difficult so was not performed. She was discharged on Dilantin as a prophylactic against further seizures, to be reviewed in 3 months time to determine the rate of progression of the lesion. She represented a month following discharge, complaining of headaches and dizziness, with vomiting and drowsiness. On examination she showed early papilloedema, left worse than right, a dilating non-reactive left pupil, an upgoing right plantar and strabismus. She died within 6 hours of admission.

The specimen consists of four coronal slices of the frontal lobes, viewed from the back. The right hemisphere is greatly enlarged, with midline shift to the left and subfalcine herniation. Within the white and

grey matter of the right frontal lobe medially is a very poorly defined fairly uniform pale lesion. The anterior horn of the right lateral ventricle is pushed backwards.
Diagnosis: Astrocytoma (confirmed histologically) in right frontal lobe
Comment: It seems likely that the patient's tumour had been present for the 12 months before her presentation. The onset of seizures in an adult is highly suspicious of a space-occupying lesion. She then fairly rapidly developed features of raised intracranial pressure (headaches, vomiting, drowsiness, papilloedema) and died within 5 weeks of diagnosis.

CASE 25296
The patient was a man aged 68 who was admitted with a history of purpuric rash on the abdomen for 2 weeks. On the day of admission there was paraesthesia in the right arm followed by weakness. On examination there was weakness of the right upper limb and there was a purpuric rash on the trunk and legs. The blood showed: WCC 12.5 x 10^9/L (4-12 x 10^9/L); RBC 4.63 x 10^{12}/L (4.5-6.5 x 10^{12}/L), haemoglobin 142 g/L (130-180 g/L), platelets 70 x 10^9/L (150-400 x 10^9/L). He was treated with platelet transfusions, prednisolone and azathioprine. The bone marrow showed hyperplasia of megakaryocytes. About two weeks after admission he became febrile and developed multiple pustules on the skin, followed by jaundice and acute renal failure. Splenectomy was performed but he did not improve and died two days later.
The specimen consists of a coronal slice though the cerebral hemispheres viewed from the front. Within the left fronto-parietal region is a well-demarcated dark brown lesion 20mm in diameter that has a friable appearance.
Diagnosis: Focal intracerebral haemorrhage in idiopathic thrombocytopenic purpura (ITP)

CASE 25308
This man was aged 76 years at his death. Three years earlier a carcinoma of the post-nasal space was diagnosed after investigation for difficulty in breathing. At that time local resection was performed, and there was a further resection a year later for local recurrence and a 3rd resection ten months later. Two months thereafter he developed left-sided headache and diplopia to the right, resulting from paralysis of the left medial rectus. Cytotoxic drugs were infused into the left carotid artery and eye movements returned, but he went gradually deteriorated and died 7 months later.
The specimen consists of a coronal slice through the cerebral hemispheres viewed from the front. There is a well-demarcated mass extending into the brain matter in the inferior left frontal lobe and to a lesser extent the inferior right frontal lobe. The mass has a variegated appearance, ranging from cream to black with grey areas of necrosis. There is some oedema of the left hemisphere and the midline structures are displaced slightly to the right.
Diagnosis: Carcinoma of nasopharynx invading base of brain
Comment: At post-mortem massive tumour involvement of the sphenoid and ethmoid sinuses with extension to the left orbit and to the inferior surface of the frontal lobes, particularly on the left side, was found. Histologically it was adenocarcinoma.

CASE 25320
The patient was a woman aged 75. A month before her death she suffered a myocardial infarction with pulmonary oedema, for which she was given a diuretic. Shortly thereafter a left hemiplegia appeared and she was transferred to the RAH from Kangaroo Island. Examination showed left hemiplegia with increased reflexes and an upgoing toe on the left side. She was disorientated in time but not in place or person. The voice was slurred. She gradually became drowsy and died on the 6th day.
The specimen consists of a coronal slice through the cerebral hemispheres, viewed from the back. Within the territory of the right middle cerebral artery there is some haemorrhagic discolouration of the cortex, with oedema of the underlying white matter. In addition there is an area of atrophy, discolouration and cystic

change in the region of the right hippocampus (front of pot). There are no features of raised intracranial pressure present within this specimen.
Diagnosis: Old (right hippocampus) and recent (right MCA territory) cerebral infarcts
What relationship might the recent infarct have to the recent myocardial infarction? Thrombus can form in the left ventricle following infarction as a result of endocardial damage. The thrombus may embolise, particularly sooner rather than later, and occlude an artery downstream. The middle cerebral artery is a classic site due to the more direct pathway of blood flow to this artery from the heart via the carotid arteries. The haemorrhagic nature of the infarct suggests embolism as the cause.

CASE 25383
This man aged 64 had a pneumonectomy 4 years previously for squamous cell carcinoma of the lung. There was no recurrence. A month before his final admission he suffered a left cerebro-vascular accident that resulted in right hemiparesis and dysphagia. His final admission was for gangrene of the left toes consequent upon atherosclerotic thrombosis of the left femoral artery. He died after a few days in hospital.
The specimen consists of two coronal slices of the cerebral hemispheres viewed from the front. There is an area of loss of normal structure within the territory of the left middle cerebral artery. The cortex is thinned and the white matter appears necrotic.
Diagnosis: Healing left middle cerebral artery territory infarct

CASE 25428
This patient was first admitted in April 1975 at the age of 42. Malignant melanotic deposits in groin lymph nodes had been excised a year previously. Symptoms began early in the morning with a feeling that the left side of the body was missing. Shortly thereafter a Jacksonian fit occurred, affecting first the left leg and then the left arm. He was in hospital for a week. He was readmitted a month later after a further fit, again affecting the left side, this time with loss of consciousness. Investigations showed a solitary cerebral lesion that was biopsied at craniotomy. Symptoms soon recurred and his last admission was in December 1975, with left hemiparesis and left 7th nerve palsy. The CSF pressure was greatly raised and he died after 3 weeks.
Without looking at the specimen, on the basis of this patient's symptoms and signs, where do you expect the lesion to be?
Right motor cortex.
The specimen consists of a coronal slice through the cerebral hemispheres, viewed from the back. Within the right fronto-parietal area is a well-demarcated lesion that ranges in colour from grey to brown with areas of necrosis and haemorrhage and which measures 60 x 45mm. There is some oedema of the adjacent white matter causing subfalcine herniation of the right cingulate gyrus to the left, compression of the right lateral ventricle and deviation of the septum pellucidum to the left. There is notching of both unci.
Diagnosis: Metastatic malignant melanoma (confirmed histologically)
Comment: The grey areas represent haemorrhage. Note that there is no pigmentation macroscopically.

CASE 25435
The patient was a woman aged 60 who was admitted with a history of severe headache for 2 days followed by sudden loss of consciousness. On admission she responded to painful stimulation. All limbs were rigid. There was mild neck stiffness and the BP was 150/110. Lumbar puncture showed blood-stained CSF under increased pressure. Brain scan was normal.
The specimen consists of the right half of the brain divided in the sagittal plane. There is a 35mm dark brown lesion extensively involving the midbrain and 3rd ventricle with similar material in the 4th and right lateral ventricles. Anteriorly the lesion is confined by a capsule and the basilar artery can be seen running along the anterior surface of the pons into the lesion, which is partly formed by an aneurysm 25mm in diameter. There is only mild atherosclerosis of the basilar artery.

Old brown staining of the arachnoid, indicative of earlier subarachnoid bleeding, is conspicuous at the frontal pole, around the olfactory bulbs and in the root of the Sylvian fissure (the latter is best seen from the base of the jar).
Diagnosis: Ruptured berry (saccular) aneurysm of the basilar artery

CASE 25437
The patient was a woman aged 79 with a past history of maturity-onset diabetes. She had had episodes of confusion and disorientation for some time. She was hypertensive and had suffered a stroke 3 years previously, which left her with a left homonymous hemianopia. Two days before her last admission severe frontal headache and vomiting occurred. In hospital she was drowsy. The left pupil was larger than the right and both plantar reflexes were flexor. On the 2nd day she lapsed into coma with increased reflexes on the right side and decreased reflexes on the left side. Both plantar reflexes were extensor, the left pupil measured 1mm and the right 3mm, both unreactive. She remained in a decerebrate posture for a further day and died.
The specimen consists of the lower half of the brain divided in the transverse plane. The brain appears small generally. On the inferior aspect, the right occipital lobe is shrunken and is covered by thickened meninges. The cut surface of the specimen shows slight dilatation of the lateral ventricles. There is a 5mm lacune in the right putamen and another in the right thalamus.
Diagnosis: Old right occipital infarct
Comment: At post-mortem, massive recent ischaemic softening of the right cerebellar hemisphere was found to account for the patient's presentation. Lacunes in the basal ganglia are typically seen with hypertension.

CASE 25486
The patient was a woman aged 61 who had been hypertensive for 20 years and had suffered from angina pectoris for 14 years, which had been getting worse during the preceding 6 months. She was brought into hospital collapsed and unconscious. Her BP was 215/115 and her pupils were fixed and dilated. There was paralysis of the left side of the tongue and of the left side of the body. She died that day.
The specimen consists of the lower half of the brain divided in the transverse plane. There is a large thin-walled aneurysm about 15mm in diameter arising where the left middle cerebral artery divides into its branches in the Sylvian fissure, about 20mm from its origin. There is recent subarachnoid haemorrhage over the orbital surfaces of both frontal lobes, over the lateral aspect of the left frontal and temporal lobes and also around the brain stem and cerebellum. In addition, there is a large elongated haematoma measuring 70 x 30mm within the white matter of the left frontal lobe that communicates with the subarachnoid space near the aneurysm. The haematoma has caused midline shift to the right. The right hemisphere otherwise appears within normal limits. A small unruptured aneurysm about 4mm in diameter is present at the division of the right middle cerebral artery in a position similar to that on the left. The arteries of the circle of Willis show only mild atherosclerosis. The cerebellar tonsils, particularly the left, appear prominent.
Diagnosis: Ruptured berry/saccular aneurysm of the left middle cerebral artery causing subarachnoid and intracerebral haemorrhage
Comment: The side of the patient's paralysis does not seem to fit with the side of the lesion. It is possible that the contralateral cerebral peduncle was compressed as a result of transtentorial herniation. The parahippocampal gyri are not readily seen to assess its presence, though it is likely as there is probable tonsillar herniation. Also the brainstem and cerebellum have not been examined.

CASE 25501

The patient was a woman aged 61 who was admitted in July 1976, three weeks after an apparently uneventful cholecystectomy. The only presenting feature was persistent and unexplained vomiting, for which no abdominal cause was found. A few days later she was noted to have a lower motor neurone left facial weakness. The next week she became increasingly unsteady and developed nystagmus and ataxia of the left limbs. She was examined by a consultant neurologist who found left motor neurone 7th nerve lesion, vertical and transverse nystagmus, left finger-nose and heel-shin ataxia and ataxia of gait. He considered that there was a lesion in the pons. There was a lymphocytosis in the CSF.

Three weeks after admission the level of consciousness deteriorated with increased ophthalmoplegia, ataxia and sensory signs in the limbs and fingers. Right carotid arteriogram was normal. She died 7 weeks after admission.

The specimen is mounted in two jars:

One specimen consists of a transverse section through the pons and cerebellum. Within the posterior aspect of the pons is an ill-defined pale and pink fleshy mass 35mm in diameter that has obliterated the cavity of the 4th ventricle. The mass has a central pale pink area surrounded by a zone of pale cream tissue that infiltrates the surrounding brain. The pyramidal fibres anterior to the tumour appear relatively uninvolved.

The other specimen consists of a coronal section through the cerebral hemispheres viewed from the back. The septum pellucidum is distorted by a pale pink mass 15mm in diameter. This has a similar appearance to the central area in the pontine lesion, and also has an infiltrative margin with no evidence of necrosis or haemorrhage.

Diagnosis: The features are those of tumours. The presence of 2 apparently separate lesions suggests metastases, although the appearance isn't typical and they could communicate through the midbrain. Alternatives include astrocytoma, glioblastoma and oligodendroglioma. Histology revealed both lesions to be oligodendrogliomas.

CASE 25645

No clinical history is available.

The specimen consists of a coronal slice of the cerebral hemispheres viewed from behind. Within the white matter of the right fronto-parietal region medially is a lesion 40 x 25mm comprising many large vascular spaces. The lesion has ruptured and blood is present in the lateral and 3rd ventricles.

Diagnosis: Vascular malformation with intraventricular rupture

CASE 25674

The patient was a man aged 32 who presented to Modbury Hospital with a history of fever, cough and pleuritic chest pain for one week. In hospital progressive pulmonary consolidation developed, together with acute renal failure for which dialysis was begun on the 3rd hospital day. Later bilateral pneumothoraces occurred.

Three weeks later lung biopsy showed organizing interstitial pneumonia. Shortly thereafter he developed left hemianaesthesia and left facial paralysis, and he died in deep coma a week later.

The specimen is a coronal slice of the cerebral hemispheres. Within the white and deep grey matter of the right frontal lobe is a well-circumscribed necrotic haemorrhagic lesion 55x30mm that compresses the right lateral ventricle and pushes the septum pellucidum to the left.

Diagnosis: Cerebral abscess in right frontal lobe

Comment: The appearances are easily misinterpreted as a necrotic and haemorrhagic tumour. At post-mortem there were bilateral pneumothoraces, broncho-pleural fistulae, interstitial organizing pneumonia, abscesses within the pancreas, candidal pyelonephritis, a small peptic ulcer on the greater curvature of the stomach and small thrombotic vegetations on the aortic valve. Histology showed the cerebral lesion to contain yeast forms and pseudo hyphae consistent with *Candida albicans*. Systemic infection by candida only occurs in immunocompromised patients but there is no indication given of this in the history.

CASE 25675
The patient was a woman aged 67 who was admitted semicomatose. There was a history of changed behaviour with depression, forgetfulness and headaches. On examination there was fluctuating consciousness, marked neck stiffness, bilateral papilloedema, right 6th nerve palsy, and generalised hyperreflexia with extensor plantar responses. A brain scan showed a deep midline area of increased uptake, extending into both lateral hemispheres. Permission for biopsy was refused and she died on the 3rd day.
The specimen consists of a right sagittal section of the cerebral hemispheres, brainstem and cerebellum. The splenium of the corpus callosum is expanded by a poorly defined pale brown lesion 25mm in diameter. Laterally the tumour extends into adjacent white matter. The great cerebral vein is displaced downwards, and the lesion has also caused some displacement and distortion of the pineal gland and the colliculi.
Diagnosis: Astrocytoma of the corpus callosum (confirmed histologically)
Comment: The lesion doesn't quite seem big enough to account for all the clinical features but no further information is available. Possibly involvement of the hemispheres was more extensive.

CASE 50048/83
The patient was a 50 year old man.
The specimen displays two coronal sections through the cerebral hemispheres viewed from behind. There are multiple well-demarcated dark brown to black lesions scattered throughout both hemispheres. Some also show evidence of necrosis and they vary from 3-20mm in diameter.
Diagnosis: Metastatic melanoma (confirmed histologically)
Comment: The patient had a known history of metastatic melanoma.
On the basis of the appearance of the specimen, what symptoms and signs would you have expected to see in the patient during life?
- symptoms and signs of raised ICP. There may not be evidence of herniation, but he may still have had headaches, worse in the morning associated with nausea, with papilloedema on examination
- space occupying lesions may act as epileptogenic foci, so seizures
- focal neurological symptoms and signs due to destruction of neural parenchyma

CASE 50080/83
This 59 year old woman presented with a sudden onset of aphasia and right hemiparesis without any prior symptoms. Although initially alert her conscious state deteriorated and she died after 24 hours.
At autopsy there was evidence of hypertensive cardiomegaly with an old myocardial infarct.
The specimen displays two coronal sections through the cerebral hemispheres viewed from the front. The left hemisphere is swollen with loss of grey-white demarcation and cortical petechial haemorrhages in the left middle cerebral artery territory.
There is compression of the left lateral ventricle and displacement of the midline structures to the right.
Diagnosis: Haemorrhagic left middle cerebral artery infarct

CASE 50086/83
The patient was a woman aged 78. No further history is available.
The specimen displays two coronal sections through the cerebral hemispheres viewed from the back. There is a well-circumscribed red-brown lesion 30x15mm within the region of the left basal ganglia. The lesion is surrounded by a rim of orange-brown staining in the brain parenchyma. The left lateral ventricle is distorted and slightly compressed.
Diagnosis: Intracerebral capsular or deep cerebral haemorrhage
Comment: The orange brown staining surrounding the haemorrhage represents haemosiderin. Haemoglobin is phagocytosed by macrophages and converted to haemosiderin. Its presence suggests that the haemorrhage is not very recent.

On the basis of the appearance of this specimen how would you have expected the patient to have presented? The patient would have presented with a relatively rapid onset of right-sided weakness and possibly sensory symptoms due to involvement of the left internal capsule.

CASE 50127/83

This 64 year old woman had a past history of carcinoma of the breast. She then developed carcinoma of the lung and deteriorated within 12 months with left-sided weakness and sensory inattention. She died after suffering a large melaena that was managed conservatively.

The specimen displays three coronal sections through the cerebral hemispheres viewed from the back, as well as a sagittal section of the right cerebellum. Multiple focally necrotic grey-white lesions with well-defined margins are scattered through both cerebral hemispheres. The largest measures 25mm in dimension and is destroying the right cingulate gyrus with distortion of the adjacent corpus callosum and right lateral ventricle. There are 2 small cerebellar deposits - one in the right dentate nucleus.

Diagnosis: Metastatic carcinoma

Comment: At autopsy it was evident that she had died from hypovolaemic shock related to a bleeding duodenal ulcer. There was widespread metastatic small cell undifferentiated carcinoma involving the lungs, kidneys, adrenal glands, hilar lymph nodes, pancreas, liver, thyroid and brain. The findings were consistent with a primary in the lung.

CASE 50409/83

This 60 year old man presented with intellectual deterioration and memory impairment. A midline lesion was discovered on CT scan and a biopsy was performed. During his treatment he progressively deteriorated and died with bronchopneumonia.

The specimen displays a coronal section of the cerebral hemispheres. A mass measuring 25mm in diameter is present within the septum pellucidum. Its cut surface is variegated yellow, grey and white, with small areas of necrosis but no haemorrhage. The mass infiltrates the inferior portion of the corpus callosum.

Diagnosis: Glioblastoma multiforme (confirmed histologically) in septum pellucidum

CASE 50134/84

The patient was a woman aged 67 who had recently undergone a total hip replacement.

The specimen consists of 2 coronal sections of the cerebral hemispheres viewed from the back. Petechial haemorrhages are scattered through the central white matter, particularly evident in the corpus callosum and parasagittal region of the occipital lobes. Within the watershed areas between the anterior and middle cerebral artery territories bilaterally there are petechial haemorrhages in the cortex with slight pallor of the underlying white matter.

Diagnosis: Petechial haemorrhages and watershed infarction

Comment: There are many causes of petechial haemorrhages (in addition to haemorrhagic infarction) in the CNS including:

- trauma: diffuse axonal injury; fat embolism
- infections: cerebral malaria; viral menigoencephalitis
- septicaemic shock
- thrombocytopenia e.g. thrombotic thrombocytopenic purpura; DIC
- hypertensive encephalopathy
- allergic hypersensitivity

In this case the history of a recent hip replacement suggests the possibility of fat embolism. Histological examination of sections using the stain oil-red-O (for fat) confirmed its presence within the vascular tree.

CASE 50160/84
The patient was a man aged 41.
The specimen consists of a coronal section of the frontal lobes viewed from the front. There is a large poorly defined infiltrating grey-white mass 80x40mm with focal areas of haemorrhage and necrosis in the white matter of both sides, though predominantly left, that has extended across the corpus callosum.
Diagnosis: Glioblastoma multiforme (confirmed histologically) in cerebral hemispheres
On the basis of the appearance of this specimen, how might the patient have initially presented?
- symptoms and signs of raised ICP. There may not be evidence of herniation, but he may still have had headaches, worse in the morning associated with nausea and there may have been papilloedema on examination
- space occupying lesions may act as epileptogenic foci, so seizures.
- impaired function due to destruction of neural parenchyma, in this case frontal lobe symptoms: loss of judgement; loss of inhibition; apathy; personality change; incontinence etc

CASE 50261/84
The patient was a man aged 70.
The specimen consists of a coronal section of the cerebral hemispheres viewed from the back. There is a large yellow-grey mass 50x50mm with infiltrating margins present in the left temporal lobe extending into the parietal lobe. The mass contains areas of necrosis and small haemorrhages. The surrounding white matter is swollen and there is shift of midline structures to the right. The left parahippocampal gyrus and left cingulate gyrus appear grooved.
Diagnosis: Glioblastoma multiforme (confirmed histologically) in left temporal lobe with transtentorial herniation

CASE 50427/84
The patient had been subject to a head injury. No further information is available.
The specimen consists of two sagittal slices of the cerebellum. Within the dentate and surrounding white matter there are areas of cerebral disruption with elongated (see back of pot) areas of orange brown staining.
Diagnosis: Haemosiderin pigment deposition representing old haematoma

CASE 50204/85
The patient was a woman aged 32.
The specimen consists of a coronal section of the cerebral hemispheres viewed from the front. There is an irregular 35x25mm area of deeply discoloured cortex and white matter in the left parasagittal region. There is some oedema of the underlying white matter.
Diagnosis: Haemorrhagic cerebral infarction
Comment: This is an unusual site for an infarct. It followed idiopathic superior sagittal sinus thrombosis (not shown).

CASE 50178/86
No clinical history is available.
The specimen consists of two coronal sections of the cerebral hemispheres viewed from the back. There is a large infiltrating lesion 55x30mm in the right temporal lobe. The cut surface of the tumour is pale grey with areas of necrosis and haemorrhage. The right hemisphere is swollen and the surface gyri are flattened.
Diagnosis: Glioblastoma multiforme (confirmed histologically) in right temporal lobe

CASE 50333/86
No clinical history is available
The specimen consists of two coronal sections of the cerebral hemispheres viewed from the back. Within the territory of supply of the left middle cerebral artery the cortex shows extensive haemorrhagic discolouration and the underlying white matter is oedematous.
Diagnosis: Haemorrhagic infarction of left middle cerebral artery territory

CASE 50350/86
No clinical history is available.
The specimen consists of a coronal section of the cerebral hemispheres viewed from the back. There is a firm grey-white nodule 10mm in dimension arising in the choroid plexus within the right temporal horn of the lateral ventricle. It appears clearly demarcated from the surrounding tissues and has no necrosis or haemorrhage.
Diagnosis and comment: The commoner tumours of the lateral ventricles include ependymomas, meningiomas, metastatic tumours and choroid plexus papillomas. The tumour does not have the papillary appearance of a choroid plexus papilloma and there is no history to suggest metastasis. Histology revealed this to be a meningioma.

CASE 50511/86
No clinical history is available.
The specimen is present in two pots. In each case the specimen is a coronal section of the cerebral hemispheres viewed from the back. There is thinning of the cortex with liquefaction of the underlying white matter in the right temporal lobe and inferior part of the adjacent frontal lobe. Similar changes, thougb not quite as extensive, are present within the left temporal lobe. The hippocampi have been destroyed.
Comment: The features are those of liquefactive necrosis. In view of the distribution, previous *Herpes simplex* encephalitis is the most likely cause. The distribution is against an ischaemic or traumatic aetiology.

CASE 50531/86
No clinical history is available
The specimen is a coronal section of the cerebral hemispheres viewed from the back. Within the central part of the right cerebral hemisphere is an irregular lesion 40x35mm that has a grey cut-surface and is partly cystic and partly necrotic. The adjacent white matter is oedematous and the right lateral ventricle is compressed but the left dilated. The surface of the cerebral hemisphere is flattened, secondary to brain swelling.
Diagnosis: Glioblastoma multiforme (confirmed histologically) in right cerebral hemisphere

CASE 50591/86
The patient was a 68 year old woman with a past history of hypertension and a cerebrovascular accident five years previously which had left her with a right hemiparesis. On admission she was unresponsive, with fixed pupils, irregular respirations and bilateral up going plantar responses. There was no spontaneous movement of the limbs on either side of the body. She died shortly after admission.
The specimen consists of two coronal sections of the cerebral hemispheres viewed from the back. There is a well-demarcated 60x30mm dark brown lesion with an irregular flame shape present in the region of the right basal ganglia and adjacent white matter and extending inferomedially to involve the thalamic nuclei and the midbrain. The mass has produced marked expansion of the right cerebral hemisphere, with shift of the midline structures across to the left and formation of a right subfalcine hernia. In the upper section there is notching of the right uncus. In addition, there is an old slit-like cystic lesion in the outer aspects of the left caudate and putamen, also cutting across the left internal capsule in the upper section.

Diagnosis: Intracerebral haemorrhage on right with subfalcine and uncal herniation and small old infarct in left capsular region
Comment: At autopsy there was marked left ventricular hypertrophy, in keeping with the past history of hypertension. The absence of haemosiderin suggests that the old lesion in the left internal capsule/basal ganglia region was an infarct, although it is a typical site for haemorrhage.

CASE 50845/86
No clinical history is available.
The specimen includes cerebellum, pons and medulla. Indenting the lower pons and upper medulla on the left is a 25mm diameter bisected aneurysm filled with old thrombus. The aneurysm is continuous with the basilar artery above and both vertebral arteries below. Subarachnoid haemorrhage is present over the right and upper cerebellum.
Diagnosis: Ruptured saccular/berry aneurysm of basilar artery

CASE 50090/87
The patient was a 64 year old man who presented with a two month history of progressive headache, which was worse in the morning. On admission there was papilloedema, and CT scan showed a mass in the right occipital region.
The specimen consists of a coronal section of the cerebral hemispheres viewed from the back. There is an ill-defined infiltrating lesion 40x30mm involving the white matter of the right occipital region. The lesion is greyish in colour with pale yellow areas of necrosis. The lesion infiltrates white matter and across the splenium of the corpus callosum that is greatly expanded. It completely obliterates the occipital horn of the right lateral ventricle. There is surrounding oedema and notching of both parahippocampal gyri.
Diagnosis: Glioblastoma multiforme (confirmed histologically) in right occipital lobe and corpus callosum

CASE 50116/88 A and B
The patient was a 59 year old man who suffered a cardiac arrest while under anaesthesia during an operation on his lumbar spine. He was resuscitated, but remained in a vegetative state until his death three weeks later.
There are 2 specimens. Both consist of a coronal section of the cerebral hemispheres. A is viewed from the front, B from the back. The two specimens are similar in appearance and show widespread thinning of the cortex throughout the various vascular territories. The cortex also shows patchy discolouration, with the deeper layers appearing darker in colour.
Diagnosis: Diffuse hypoxic damage
How can you relate the pathological findings to the clinical history? Prolonged cardiac arrest leads to widespread selective neuronal necrosis with selected neurones in the cerebral cortex, hippocampus, basal nuclei and the Purkinje cells of the cerebellum being most affected. Loss of neurones in the cortices thus leads to thinning.
Comment: In the context of a complete circulatory arrest at normal body temperature, complete clinical recovery is unlikely if the period of arrest is more than 10 minutes. Adequate cerebral perfusion does not start immediately the heart starts pumping again, and any period of pre or post- arrest hypoperfusion is also important in determining outcome.

CASE 50336/92
The patient was a 72 year old woman who presented with neurological symptoms that on CT scan were found to be due to a right temporo-parietal tumour mass. She was also found to have masses in the right upper and lower lobes of the lung, which on biopsy were diagnosed as adenocarcinoma. As no other primary sires were found on investigation the lung was thought to be the site of origin of the tumour.
The specimen consists of a coronal section of the cerebral hemispheres viewed from the back. There is a well-circumscribed 25mm diameter lesion within the right lateral temporo-parietal area. The lesion has a

pale colour with no evidence of haemorrhage but there are foci of necrosis. There is some oedema of the white matter associated with compression of the right lateral ventricle.
On the back of the specimen there is a similar 6mm well-circumscribed lesion in the left parietal cortex.
Diagnosis: Metastatic adenocarcinoma of lung

CASE 50140/94
The patient was a 55 year old woman who was found unconscious on the footpath. On arrival in hospital she was found to be unresponsive and hypertensive with a fixed dilated right pupil. CT scan showed a large haematoma in the right Sylvian fissure.
She was ventilated and sedated but her condition was too severe to allow surgery and she died the day after admission.
The specimen shows the circle of Willis viewed from below. There is an 18mm diameter saccular aneurysm present at the bifurcation of the right middle cerebral artery. In addition there are small aneurysms on the anterior communicating artery and at the bifurcation of the left middle cerebral artery.
Diagnosis: Saccular/berry aneurysms of the right middle cerebral, left middle cerebral and anterior communicating arteries

CASE 50236/94
The patient was a 20 year old woman with congenital hepatic fibrosis who collapsed with a severe headache of sudden onset while in hospital for treatment of an unrelated condition. A CT scan revealed a large intracerebral haemorrhage. Her condition rapidly deteriorated and she died 12 hours later. At post-mortem multiple cysts were present in both kidneys.
The specimen shows the circle of Willis, which has been dissected off the base of the brain. There is a large saccular aneurysm 18mm in diameter present at the bifurcation of the left middle cerebral artery. It is filled with laminated thrombus. A 6mm aneurysm is present on the anterior communicating artery and a 2mm aneurysm is present at the bifurcation of the right middle cerebral artery.
Diagnosis: Multiple saccular/berry aneurysms
Comment: The one on the left MCA had presumably ruptured.
What is the likely relationship between the berry aneurysms and the renal cysts? Cerebral aneurysms of this type are well recognised to occur in association with adult polycystic disease of the kidney (autosomal dominant).

CASE 50117/99
The patient was a man aged 49 with a past history of subarachnoid haemorrhage and cerebral infarction.
The specimen shows the circle of Willis, which has been dissected off the base of the brain, viewed from above. There is a 12mm unruptured aneurysm present at the junction of the left internal carotid artery and the left middle cerebral artery.
Clips are present over aneurysms in the anterior communicating artery and at the apex of the basilar artery.
Diagnosis: Multiple saccular/berry aneurysms with previous clipping