Proceedings of the Society of British Neurological Surgeons

The 76th meeting of the Society of British Neurological Surgeons was held in New York on 10-14 October 1967 as a joint meeting with the Neurosurgical Society of America.

THE TRANSPORT OF SUGARS BY THE CHOROID PLEXUS

KEASLEY WELCH and KEITH SADLER (Denver) said that they had studied the transport of D-glucose, D-galactose, L-arabinose, and fructose by comparing the concentration of sugar in new choroidal cerebrospinal fluid, sampled by the method of de Rougemont et al., with concentration in plasma under a variety of circumstances.

For galactose, arabinose, and fructose the transport was clearly co-operative, little sugar entering new fluid at low plasma levels, but when these were raised a disproportionate increase occurred. For glucose the mechanism seemed slightly co-operative in that at low concentrations there was a proportionate increase with increase in plasma concentration.

The flows of individual sugars and the interactions between the flow of one and that of another could not be accounted for on the basis of ordinary theory of carrier mediated transport. They had attempted to deal with the behaviour on the basis of a model by Cangeux et al. which accounted for co-operative effects on the basis of the highly-ordered lattice structure of the membrane.

THE SEPARATION OF CRANIOPAGUS TWINS

JOHN E. A. O'CONNELL (London) described his experience with the separation of three pairs of twins, each with a complete parietal craniopagus. He stressed three points. Firstly, placement of the scalp incision to afford direct access to the line of contact between the brains. Secondly, preservation of the venous return of at least one brain, and, thirdly, effective coverage of the large area exposed by dura, scalp, and a rigid replacement for the bone. The importance of investigation, especially by angiography, was stressed. In each pair of twins there had been one survivor. The operative procedure in one pair was described and illustrated.

AN EXPERIMENTAL STUDY OF THE ELECTRICAL ACTIVITY OF THE SPINAL CORD

DONALD L. ERICKSON, WILLIAM E. BRADLEY, SHELLEY N. CHOU, and LYLE A. FRENCH (Minneapolis, Minn.) said that electrical activity of the spinal cord had been studied by surface recordings of a.c. and d.c. potential changes. Immediately following transection by local cooling there was slowing and hypersynchrony of a.c. activity and a positive d.c. shift. These changes were suppressed when pentobarbital was used but present with N2O and ether. The caudal segment was refractory to strychnine tetanus for 5-10 min, and, presumably, all elements participated in this change, which was probably associated with the d.c. shift.

MUSCLE SPLITTING APPROACHES TO THE CERVICO-DORSAL SPINE

WILLIAM E. HUNT (Columbus, Ohio) said that the strong transverse pull of trapezius and rhomboid muscles causes severe post-operative pain and occasional wound dehiscence following midline incisions in the cervico-dorsal region.

A transverse incision with under-cutting of the median raphe for bilateral high dorsal laminectomy, and an oblique incision for unilateral approach to the lower cervical facets was described. Particular attention to the precise conformation of the spines and laminae made reliable identification of the level possible.

These approaches had been in regular use for over 10 years without wound complications.

A POSTERO-LATERAL APPROACH TO CERVICAL OSTEOPHYTIC DISC LESIONS

A. A. JEFFERSON (Sheffield) described a postero-lateral approach to cervical disc lesions. The posterior cervical muscles were divided transversely at the level of the lesion and this approach could be combined with a laminectomy. Almost horizontal access to the front of the theca was obtained by extending the bone removal laterally to include the medial portion of the articular facet. Two adjacent lesions had frequently been excised; on one occasion three adjacent discs had been operated upon.

Five of the patients had pain as their main symptom, the remainder showed evidence of 'myelopathy'. Of 27 operated patients, none were worse, four were unchanged, 13 were improved, while 10 were classified as good or very good. Six previously incapacitated males had returned to work.

TREATMENT OF ACROMEGALY

PHILIP HARRIS, W. M. HUNTER, and JUDITH STEEL (Edinburgh) described the tests for human growth hormone using a radio-immune assay. They said that external irradiation of the pituitary was inadequate and that...
complete ablation of the adenoma and the pituitary was required. If the adenoma was confined to the sella it could be ablated by stereotaxic cryogenic techniques. If there were evidence of extra-sellar extension then total excision of gland and adenoma by craniotomy was necessary. Post-operative radiotherapy and operative risks were discussed.

GROWTH HORMONE ASSAYS AND HISTOLOGY IN PITUITARY LESIONS

ROBERT S. KNIGHTON (Detroit, Mich.) reported a study of eight patients with acromegaly and one pituitary giant in whom growth hormone assays had been correlated with the histological features of their tumours. Light microscopy showed predominance of eosinophils in three, hyperplasia in one, amphotils in one and equal numbers in the others. Electron microscopy showed all cells to contain secretory granules which differed in their quantity and distribution, being most dense in the eosinophils, which also had prominent Golgi apparatus and alpha-cytomembranes. There was no correlation between growth hormone levels and quantity of secretory granules and they presumed that there must be some additional mechanism governing release of hormone into the blood stream.

STEREOTACTIC TREATMENT OF INTRASELLAR PITUITARY TUMOURS AND ACROMEGALY

LOUIS W. CONWAY and WILLIAM F. COLLINS (Richmond, Virg., and New Haven, Conn.) reported the results of eight cases of acromegaly with intrasellar tumour treated by stereotactic destruction of the tumour with follow-up to two to 18 months. Five cases were treated with yttrium-90 and 3 by cryosurgery. Growth hormone, adrenal, thyroid, gonad, and posterior pituitary function was assessed before and after operation. They concluded that the treatment of intrasellar growth producing tumours with yttrium was effective in decreasing circulating hormone levels and reversing acromegalic symptoms and signs while preserving other pituitary functions. Cryosurgical destruction was effective in decreasing growth hormone levels but less effective in preserving normal pituitary function.

THE TRANSCALLOSAL APPROACH TO THE ANTERIOR SURFACE OF THE BRAIN-STEM

JOHN E. ADAMS, ROLAND K. PERKINS, and RONALD J. STONEY (San Francisco) said that the transcervical retropharyngeal transclival approach was a feasible one for lesions anterior to the brain-stem from foramen magnum to midbrain level. They had used it in 10 patients: five chordomas, one meningioma, one chondrosarcoma, two basilar impressions, and one basilar aneurysm. There had been no instability of atlanto-occipital junction. Difficulty in swallowing had been the major complication, requiring tracheostomy until complete recovery. This should be the preferred approach to encapsulated chordoma, meningioma, and for treating basilar impression.

THE TRANSCALLOSAL APPROACH TO INTERIOR BRAIN TUMOURS

GEORGE EHNI (Houston, Texas) described his experiences with 12 patients having tumours in the region of the third ventricle in whom he had used a transcallosal approach. The technique of this exposure was described in detail and illustrative case histories given. He stressed the need for both angiography and ventriculography for proper localization to plan the approach.

The cases had included gliomas, epidermoids, colloid cysts, and a haematoma. In two malignant gliomas recurrences had been also removed through the same approach. There were four deaths in the series and one survivor had had a temporary hemiplegia.

SOME NEW NEUROSURGICAL INSTRUMENTS

PHILIP HARRIS (Edinburgh) described a new cordotomy knife and instruments for anterior operations on the cervical spine and cord including trans-oral atlantoaxial fusion. Other items described included a grinder, with a variety of burrs, plastic foam neck supports, a cranio-spinal support for spinal injuries, and scalp-skull radio- opaque markers for stereotaxic operations.

AREA 24 REVISED: A 15-YEAR FOLLOW-UP OF 100 CONSECUTIVE CASES OF ANTERIOR CINGULATE ISOLATION CARRIED OUT FOR THE TREATMENT OF CHRONIC PSYCHoses

KENNETH E. LIVINGSTON and BRUCE N. KVERNLAND (Minneapolis, Minn.) said that between 1949 and 1953 102 consecutive patients from a chronic mental hospital population were subjected to a restricted frontal lobotomy designed to isolate the anterior cingulate gyrus. A study of this group of patients over a 14-18 yr follow-up period provided the basis of their report.

Since clinical lobotomy fell from grace in the early 1950's, experimental studies in a number of fields had provided a substantial body of information which may provide some insight into questions raised by lobotomy in its more empirical forms. Some of these possible correlations were discussed.

TREATMENT OF MYELOPATHY ASSOCIATED WITH CERVICAL SPONDYLOSIS

DOUGLAS PHILLIPS (Bristol) said that initial treatment could be immobilization to prevent further trauma. A modified Minerva plaster collar with headband was well tolerated for three months, thereafter a short collar could be worn. Operative treatment could be by laminectomy or the anterior approach; on the whole, results favoured the latter. Twenty-five of 38 patients were fit for work after this operation. Advanced cases and those of more than two years' duration were unlikely to benefit. He stressed that urgent operation was necessary with a progressive neurological disorder of recent onset.
CONTROL OF LESION-MAKING IN PERCUTANEOUS CORDOTOMY

DONALD P. BECKER and FRANK E. NULSEN (Cleveland, Ohio) described their methods of electrode and lesion control in percutaneous cordotomy. The electrode direction was controlled by x-rays but cord penetration estimated by change of impedance at electrode tip from 100-150 Ω in cerebrospinal fluid to 300-750 in the cord. Thereafter position in the cord was estimated by mild stimulation (60 Hz, 0.5 msec, 0-3-0.5V). Stimulation at 5Hz up to 15V should not produce motor movement and thereafter lesions were made with r.f. power 1-8-2.2 W, 3 mm electrode tip. In 27 of 29 operations satisfactory analgesia had been obtained. Four moderate and five mild hemipareses had occurred.

DYNAMIC PRESSURE-FLOW RELATIONSHIPS

C. B. EARLY and WILLIAM E. HUNT (Columbus, Ohio) discussed the complex relationship between vascular pressure and flow. Resistance in a vascular bed was related to physical characteristics of blood and the calibre of vessels. This was related to tone and elasticity, which might vary independently, to neurological, mechanical and chemical stimuli. The smooth muscle of vessels reacted to a number of stimuli including CO₂ and O₂ tensions, intravascular pressure, and various vasoactive chemicals.

They had evaluated tone in vessels by estimating the pressure-flow relationship, varying the blood pressure over a 4-sec cycle by infusion and effusion of blood from the aorta. Pressure flow curves had been plotted for a number of physiological states and the paradox of falling resistance with rising tone was discussed.

EXPERIMENTAL OBSERVATIONS ON CEREBRAL VASCULAR RESISTANCE

LINDSAY SYMON (London) described a method for the assessment of regional cerebrovascular resistance by comparing venous and arterial pulse amplitude in the cortex of baboons under chloralose anaesthesia. It was found that venous pressure and pulse were dependent on input arterial pressure and pulse and the ratio of pulse height in artery and vein could be used as an index of regional cerebrovascular resistance. Release of arterial occlusion was followed by reactive hyperaemia which could be reduced by elevation of arterial pCO₂. Decrease of resistance followed increase in arterial pCO₂ and increase with reduction of pCO₂ and thiopentone administration.

CEREBRAL ANEURYSMS TREATED BY COMMON CAROTID LIGATION

CHARLES L. NEILL, LUCIEN R. HODGES, and WALTER R. NEILL (Jackson, Minn.) reported a series of 146 patients with aneurysms of internal carotid and its branches treated by common carotid ligation. Nineteen (13%) died in hospital, 14 from subarachnoid haemorrhage, five from other causes. Only two had died after the vessel was completely occluded. An 11-year follow-up showed a 4.9% mortality from re-bleeding. They concluded that this was a satisfactory method of treatment in most cases of carotid aneurysm, though less satisfactory in anterior communicating aneurysms which filled from both sides.

SURGICAL MANAGEMENT OF ANEURYSMS OF THE BASILAR ARTERY

ALAN E. RICHARDSON (London) discussed a series of 20 cases of basilar artery aneurysm treated surgically. Although three in the first seven cases had died, in the latter 13 cases only three had died when hyperventilation combined with hypotension was used. Operation was conducted through a fronto-temporal craniotomy with resection of a small portion of the temporal lobe. The aim had been to clip the neck or suitably invest it to prevent re-rupture. In some cases when the aneurysm was very rigid, clipping, ligation, and investment had been used. High quality angiography was needed to determine the exact anatomical relationship of the aneurysm to other vessels. He noted that the place of surgery in these cases and suitability for operation had still to be determined.

CRYOSURGERY IN THE TREATMENT OF TRIGEMINAL NEURALGIA

JOSEPH F. DORSEY and THONGDEE SHAIPANICH (Boston, Mass.) said that they had used cryosurgical methods in nine cases of trigeminal neuralgia, freezing selectively portions of the ganglion and posterior root. The method was described and results of a follow-up of six months to three years shown. In all cases there had been complete relief of pain, no motor paralysis, no facial weakness, and minimal paraesthesia or dysesthesia. They believed that this method approached to the ideal for these cases by permanently stopping pain without disturbing other functions of the trigeminal nerve.

ARTERIOVENOUS MALFORMATIONS OF THE SPINAL CORD

AYUB K. OMMAYA, GIOVANNI DI CHIRO, and JOHN DOPPMAN (Bethesda, Md.) described their experiences with 14 cases of spinal cord angioma. Selective catheterization was necessary in such cases for angiographic identification of the arterial supply of the angioma, for they believed that ligation of the arterial supply alone should result in obliteration of the lesion. Surgical treatment consisted of selective intradural ligation of only those vessels identified as feeders. Eleven cases had been operated on and satisfactory liguations achieved in nine. In four patients there was slight improvement and in five considerable improvement.

THE SURGERY OF RUPTURED CEREBRAL ANEURYSMS

R. H. SHEPHARD (Derby) discussed a series of 314 patients with ruptured cerebral aneurysms on the carotid circulation; 225 patients had direct operations on the aneurysm
and 25 carotid ligation. The overall mortality was 22%, which had improved in recent years. Among the survivors 85% were fully employed. He stressed the importance of avoiding undue retraction and manipulation of arteries during operation and the avoidance of damage to perforating vessels. A film was shown demonstrating the operative techniques employed.

**IATROGENIC VERTEBRAL ARTERIOVENOUS FISTULAE**

JOHN DUTTON and IAN ISHERWOOD (Manchester) presented a series of five cases of vertebral arteriovenous fistula which had occurred in a series of 761 percutaneous vertebral angiograms. The bruit was noted two to seven days after angiography. Two had syncopal attacks on neck movement and one cervical 5th nerve root compression. One case was cured by surgical operation, two resolved spontaneously a few days later, and one five years later. The venous relationships to the vertebral artery were discussed. They suggested that the ideal treatment was surgical closure of the fistula preserving the vertebral artery.

**INITIAL MANAGEMENT OF COMMUNICATED AND DEPRESSED FRONTAL SINUS FRACTURES**

JOHN M. POTTER (Oxford) said that bone removal in compound skull fractures had been overdone and in those involving the air sinuses and supraorbital ridges a more conservative attitude could be adopted. In early cases within 12 hours he did a full soft tissue wound toilet and did not remove any bone that was not grossly contaminated and without pericranium. The wound was closed and full sulpho and antibiotic cover given locally and systemically. Cerebrospinal fluid fistula was repaired later, though an aerocoele called for earlier operation. Residual bone deformity could be repaired later by plastic surgery.

**COURSE AND MANAGEMENT OF GIANT INTRACRANIAL ANEURYSMS**

T. P. MORLEY (Toronto) discussed a series of 25 cases of intracranial aneurysms larger than 2.5 cm in diameter. Most were on the carotid vessels, but there were none at posterior communicating origin or anterior communicating sites. The majority (18) presented with local pressure phenomena but six presented with haemorrhage and one bled later. Calcification or erosion of bone in plain x-rays suggested the diagnosis in 12. Angiography often failed to show the full extent of the aneurysm. He concluded that intracavernous aneurysms probably needed no surgical treatment and extracavernous ones could be treated by carotid ligation. Middle cerebral ones should be excised, but no good line of treatment could be made for those on the vertebro-basilar system. The overall mortality was 24%, which was lower than that of a large series of intracranial aneurysms of all sizes (35%).

**EXPERIMENTAL BIO-MECHANICS OF TRANSVERTEBRAL DISC RUPTURE**

FRANK P. SMITH (Rochester, N. Y.) said that he had carried out dissections of vertebral bodies and contrast studies to demonstrate the dorsal and medial orifices occupied by the confluence of basivertebral veins. Compression studies were carried out on L3-5 segments from necropsy specimens, x-rays were taken before and after compression and serial sections studied.

Results showed that compression produced vertical fractures, short of compression fractures, of the vertebral bodies and these allowed prolapse of cartilage into the body and then dorsal extrusion via the sinuses of the basivertebral veins.

**PROFOUND HYPOTHERMIA IN THE TREATMENT OF CEREBROVASCULAR DISEASE**

COLIN S. MACCARTY (Rochester, Minn.) reviewed the experiences at the Mayo Clinic with profound hypothermia during operations for aneurysms and angiomata. Seventy operations had been carried out on 69 patients with a mortality of 25.7%. A variety of cardiac by-pass techniques had been used. In 38 personally observed cases there had been seven deaths, four of which were related to the intracranial surgery. There were 24 excellent results, five good and two poor. Aneurysms treated without deep hypothermia during this period showed a mortality rate of 6.25%. This treatment had not been used since 1965 and should probably be reserved for very large aneurysms which had to be treated in a bloodless field.

**CLINICAL, RADIOLOGICAL AND ANATOMICAL CORRELATIONS OF THALAMIC LESIONS**

IRVING S. COOPER (New York) reported on the examination of 25 brains obtained from patients successfully treated for tremor and rigidity and dying later of extracranial disease. Twenty thalamic lesions were demonstrated. The successful lesions were centered in ventrolateral nucleus, extending slightly into PVL and PVM with a diameter 3-10 mm. There was evidence of somatotopic localization in VL, arm lying medial and anterior to leg. He discussed the physiological basis of tremor and rigidity and concluded that these lesions were effective because they abolished conflict at thalamic level between the two great systems that subserve sensory communication to the cortex, the striopallido-fugal and cerebello-rubro-thalamic systems.

**STEREOTAXIC LESIONS FOR PAIN**

JOHN HANKINSON (Newcastle) reviewed 40 patients who had had stereotaxic lesions for pain. The cases included thalamic pain, post-herpetic pain, various types of causalgia, and malignancy. In the earlier cases lesions were made in specific sensory nuclei and initial relief with early recurrence was the rule. In later cases large lesions (500 cu. mm) involving the centro-median-parafascicularis complex had been made bilaterally and the
results of this had been much more satisfactory, seven patients remaining free of pain with follow-up of a year or less. With these lesions there had been no sensory loss or ‘leucotomy’ effect.

EXTERNAL ALPHA PARTICLE RADIATION FOR STEREOTAXIC THALAMOTOMY

ROBERT TYM (Glasgow), J. WEYAND (Oakland, Calif.), J. LAWRENCE, and J. LYMAN (Berkeley, Calif.) discussed the rationale of various types of lesion making in treating Parkinsonism. They felt that so many variables had to be considered that a good case could be made out for making a lesion of predetermined size at a predetermined site in all patients suitable for operation and accepting this without modification. They felt this method might be used in older patients with little akinesia, slow evolution, normal ventricular size, and no intellectual loss. Two patients had been treated on this basis using external alpha particle irradiation from the 184-in. cyclotron. Details of the method and dosage were given in detail. Both patients were having second side operations and the initial results were satisfactory.

STEREOTAXIS MADE EASIER

BEN DAWSON (Salford) described a new method of aligning the x-ray beam, cassette holder, and frame of the Leksell machine. The x-ray image of the scales had been improved by the insertion of lead wires. A new electrode was described which allowed positive identification of the lesion site in lateral and A.P. x-rays.

Finally, experience with a three-dimensional monitor was discussed. This could be used for guiding an electrode to an intracerebral target or tracing its course to determine its precise anatomical position.

OBSERVATIONS ON THE LATERAL MASS OF THE HUMAN THALAMUS

J. D. W. TOMLINSON, (London) J. ANDREW (London), and E. S. WATKINS (Syracuse, New York) presented a cyto-myelo-architectonic study of the lateral thalamic mass. Their findings suggested 12 nuclei rather than the 30 of Hassler, though his nomenclature had been used as far as possible. The cytology of the nuclei and their boundary zones was illustrated.

A probability and variability study of nuclear positions had been made on measurements taken from 1 mm frozen sections through 26 human thalami, and the variability of thalamic nuclei in human brains quantified. They stressed that the absolute position of an electrode tip must come from electrophysiological studies or histological examination.

FACTORS IN THE MORTALITY OF CEREBELLAR ABSCESS

HUW B. GRIFFITH (Bristol) reported on a series of 62 cerebellar abscesses derived from three centres, Oxford, Manchester, and Bristol. Overall mortality was 29% and had not changed much in 20 years. With radical operations which included decompression, the mortality had been 14% but in those treated with burrhole aspiration it was two and a half times this figure. In patients who were unconscious or had meningitis the mortality was high and no patient having both features survived. Type of organism and sex had not influenced the mortality. Many deaths were due to medullary compression, and he stressed that a wide posterior fossa decompression was necessary whether the abscess was treated by aspiration or excision.

VALUE OF ATRAUMATIC INVESTIGATIONS IN NEUROLOGICAL DIAGNOSIS

A. R. TAYLOR, M. W. SWALLOW, and A. G. GARG (Belfast) described the investigation of 107 consecutive patients with echoencephalography and isotope brain scan and circulation time. The results were compared with the final diagnoses, if necessary after further investigations. In 77% the diagnosis was established, in the remainder further investigations were required. The diagnostic accuracy was considered to be 96% for the echoencephalogram, 93% for brain scan, and 85% for radio-circulogram. The provisional and final diagnosis corresponded in 88% of cases. In three cases diagnosis was wrong and in nine a diagnosis could not be made.

EXPERIENCE WITH ULTRASOUND B SCAN IN ADULTS

PETER H. SCHURR (London) described the methods of ultra-sonic B scans in localizing intracranial lesions. He stressed the need of experience to recognize artefacts and that this method should be used together with A scans to check interpretation. Meningiomas and gliomas could be recognized in 75% of cases and all tumours in about 50%. The method could also be used to demonstrate pulsation in deep structures such as aneurysms. He noted that tumours near the vertex or poles of the skull were the most difficult to demonstrate.

SPINAL DYSRYTHMISM

KENNETH TILL (London) discussed the embryology of spinal dysraphism excluding spina bifida cystica. The findings were summarized in 94 children. Of these 72, having 125 lesions, required operation. This was indicated when there was a low conus, an expanding lesion or evidence of tethering of the roots or cord. The lesions included split cord in 36, tethered conus in 34, tethering bands in 22, lipoma in 13, dermoid cyst in eight, dural sinus in five, hamartoma in three, and neuromeningeal cyst in one.

SURGICAL TREATMENT OF LIPOMYELOMENINGOCELE

MARTIN P. SAYERS (Columbus, Ohio) described his experience with 36 cases in which there had been no mortality and no permanent loss of function. Operation was best carried out during the first three days of life. Indications included ungainly size, associated anomalies, discomfort, and loss of function. He aimed at reducing the bulk of the fatty tumour, removing anomalous bone
and cartilage, and performing a laminectomy for two segments above the spina bifida. It was not wise to untether the cord. Re-operation had been needed in three cases due to late loss of function.

**Brain Tumour Chemotherapy with Intrathecal Methotrexate**

HORACE NORRELL and CHARLES WILSON (Lexington, Kentucky) described a technique for administering methotrexate to patients with recurrent malignant brain tumours. A Hyer-Pudenz shunt with Coe-Shulte reservoir was placed between ventricle and cisterna magna or between the ventricles. Methotrexate (0.25-0.375 mg/kg) was injected into the shunt and pumping the device ensured rapid and even dissemination in the cerebrospinal fluid. Nine patients had been treated and seven showed neurological improvement. The best results had been obtained in posterior fossa tumours of primitive type in children. The C.S.F. continued to show presence of malignant cells in spite of apparent remission of clinical features.

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**The December 1967 Issue**

**The December 1967 Issue Contains the Following Papers**

- Twelve cases of fatal cerebral infarction due to arterial occlusion in the absence of atheromatous stenosis or embolism. J. HUME ADAMS and DAVID I. GRAHAM
- Recurrent cholesterol embolism as a cause of fluctuating cerebral symptoms. W. IAN MCDONALD
- An experimental study of traumatic cerebral vascular spasm. LINDSAY SYMON
- The myenteric plexus in drug-induced neuropathy. BARBARA SMITH
- Polyneuritis cranialis associated with industrial trichloroethylene poisoning. PETER H. BUXTON and MICHAEL HAYWARD
- Myopathy with abnormal structure and function of muscle mitochondria. W. C. HULSMANN, J. BETHLEM, A. E. F. H. MEIJER, P. FLEURY, and J. P. M. SCHELLENS
- Denervated muscle fibres in hereditary mouse dystrophy. A. J. MCCOMAS and K. MROZEK
- Acute optic neuritis: its clinical features and their relation to prognosis for recovery of vision. W. G. BRADLEY and C. W. M. WHITTY
- Shrinking retrograde amnesia. D. FRANK BENSON and NORMAN GESCHWIND
- Effect of cyanide intoxication on the metachromatic material found in the central nervous system. M. Z. M. IBRAHIM and SEYMOUR LEVINE
- Long-term follow-up of nine cases of ventriculocisternostomy for non-neoplastic aqueductal occlusion. ROBERT C. CANTU and JOST J. MICHELSEN
- Von Hippel-Lindau's disease presenting at an early age. P. J. BOURDILLON and R. C. HICKMAN
- Cerebral abscess in hereditary haemorrhagic telangiectasia: report of two cases in a family. N. H. DYER
- A new method for the cytological examination of the cerebrospinal fluid. RUNE SÖRNÅS
- Synkinetic movements of the eyelid: a case with some unusual mechanisms of paradoxical lid retraction. W. G. BRADLEY and B. K. TOONE
- Encephalopathy due to visceral larva migrans. DAVID SUMNER and ELLIS G. F. TINSLEY
- Proceedings of the Society of British Neurological Surgeons: 75th meeting
- Book Reviews

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