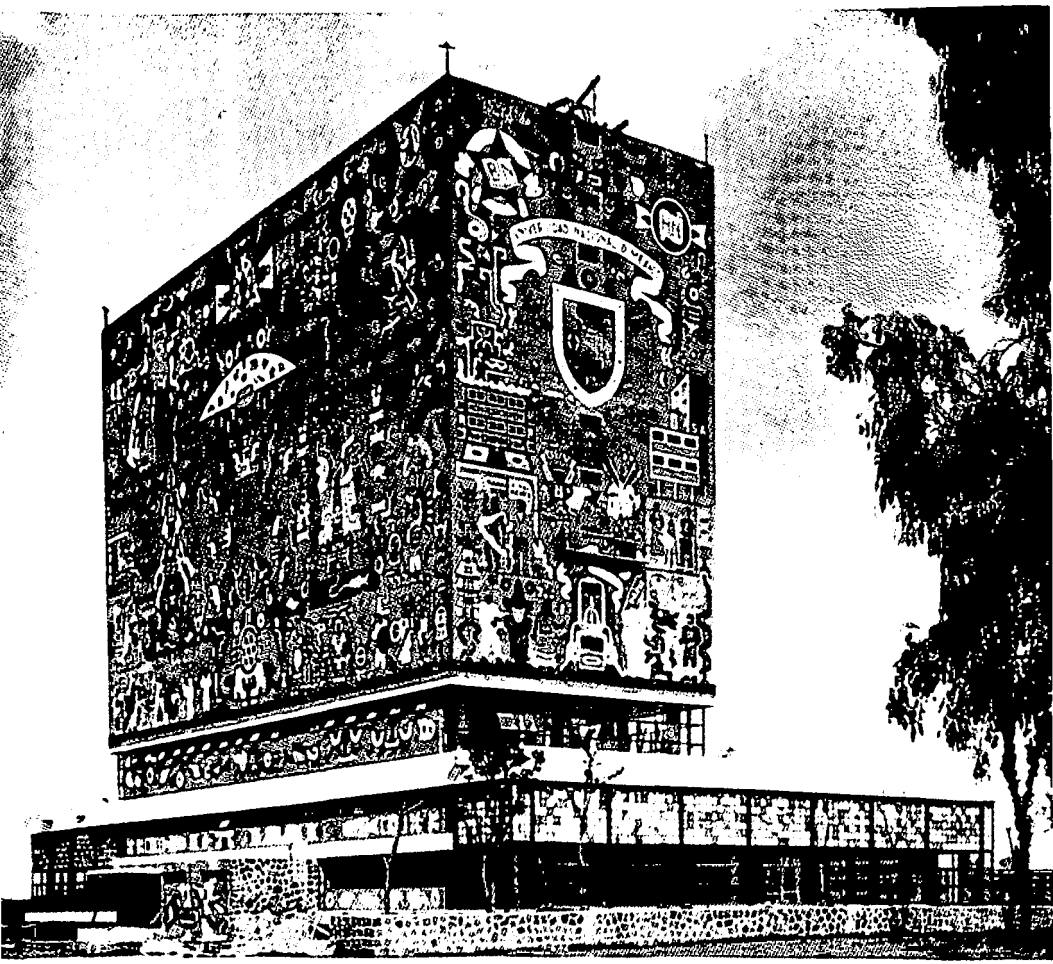
AMERICAN ACADEMY OF NEUROLOGICAL SURGERY



THIRTY-SECOND ANNUAL MEETING

Camino Real Hotel
Mexico City
November 18-21, 1970

ANNUAL MEETING 1970

CAMINO REAL HOTEL

MEXICO CITY, MEXICO

The American Academy of Neurological Surgery

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DOCTORS' PROGRAM — 1970

Wednesday, November 18

5:00 p.m. to 8:00 p.m. ..... Registration — Lobby, Salon Oaxaca
8:00 p.m. to 9:30 p.m. ..... Cocktails — Salon Oaxaca

Thursday, November 19

8:00 a.m. to 12:00 noon ..... Registration — Lobby, Salon Oaxaca
8:30 a.m. to 12:30 p.m. ..... Scientific Session — Salon Oaxaca
2:00 p.m. to 5:00 p.m. ..... Scientific Session — Salon Oaxaca
5:00 p.m. to 6:30 p.m. ..... Executive Meeting — Salon Oaxaca

Friday, November 20

8:30 a.m. to 12:30 p.m. ..... Scientific Session — Salon Oaxaca
2:00 p.m. to 4:00 p.m. ..... Tour of National Institute of Neurology of Mexico City
5:30 p.m. to 10:00 p.m. ..... Trip to Pyramids of San Juan Teotihuacan
Dinner at Monastery at Acolman Refectory

Saturday, November 21

8:30 a.m. to 12:00 noon ..... Scientific Session — Salon Oaxaca
12:00 p.m. to 12:30 p.m. ..... Executive Meeting — Salon Oaxaca
8:30 p.m. to Midnight ..... Banquet & Dance (Formal Dress optional)
The American Club of Mexico City

LADIES' PROGRAM

Wednesday, November 18

8:00 p.m. to 9:30 p.m. ..... Cocktails — Salon Oaxaca

Thursday, November 19

9:30 a.m. to 1:30 p.m. ..... Tour of Highlights of Mexico City

Friday, November 20

9:30 a.m. to 1:30 p.m. ..... Tour of Modern Mexico City
2:00 p.m. to 4:00 p.m. (optional) ..... Tour of National Institute of Neurology of Mexico City
5:30 p.m. to 10:00 p.m. ..... Trip to Pyramids of San Juan Teotihuacan
Dinner at Monastery of Acolman Refectory

Saturday, November 21

8:30 p.m. to Midnight ..... Banquet & Dance (Formal Dress optional)
The American Club of Mexico City

Scientific Program

THURSDAY, NOVEMBER 19, 1970

CEREBROVASCULAR SYMPOSIUM
CHAIRMAN: Dr. Robert Pudenz

8:30 a.m.

1. "Fluorescein Angiography of the Brain with Videotape and Operating Microscope for Control and Evaluation of Microsurgical Techniques."
William Feindel, Charles P. Hodge, and Y. Lucas Yamamoto

In previous reports to the Academy in 1966 and 1967, fluorescein angiography was described as a technique to demonstrate the epicerebral circulation in experimental animals and in man during vascular surgery. Two features of the method, the detailed view of the microcirculation of the brain and the halo or after-glow effect in and about areas of brain damage where blood-brain interfaces are disturbed, provide the surgeon with information of an order not available from X-ray angiography or from direct visual inspection of the brain's surface. Thus, the blood supply of tumor, angiomas or epileptic lesions can be selectively defined and areas of ischemia can be visually demarcated with sharp contrast from the normal cortex.

Permanent records on rapid sequence or cine photography are available only one half to six hours later. While immediate viewing of the angiogram by the surgeon through an orange filter glass has been of some value, a more satisfactory approach depends upon videotape playback. The initial difficulty of restrictive wave lengths of the activated fluorescence has been revolved by special filters and a high resolution video system with fine control of the grey scale. This provides, in our experience, a unique method of control and evaluation of microsurgical techniques particularly as applied to the cerebral microcirculation.

8:45 a.m.

2. "Experimental Cerebral Vasospasm: Clinical Correlates And Pharmacological Modification."
Bennett Stein, R.A.R. Fraser, R. E. Barrett, and J L. Pool

Studies on the reactivity of the major basal cerebral arteries and the cortical arteries have been carried out on cats and monkeys in our laboratory.

Cerebral arterial calibre has been reproducibly altered by (1) the

instillation of blood into the subarachnoid space surrounding the basilar and vertebral arteries and (2) by major alterations in arterial pCO2. These changes have been documented in acute vasoconstriction by the transclival exposure of the basilar vessels, as described by Echlin, and by a cortical window to visualize the cortical vessels. In chronic spasm arterial calibre has been documented by vertebral basilar angiography.

Attempts have been made to pharmacologically alter arterial constriction by intrathecal administration of alpha adrenergic blocking agents and related compounds. Alterations in the catechlolamine content of the perivascular nerves has been documented through the use of the fluorescent histochemical technique of Falck.

By such techniques it has been shown that subarachnoid blood will consistently produce cerebral vasospasm, acutely and in some animals lasting up to seven days. Significant constrictive effects are also produced by hypocarbia and, dilation of cerebral arteries by hypercarbia.

The intrathecal application of alpha adrenergic block agents has reversed the vasoconstrictive effect and histochemical techniques have shown a relationship between the catecholamine content of the perivascular nerves and the ability of cerebral arteries to constrict.

This data suggests that the periarterial nerve plexus plays an ancillary role in vasoconstriction whereby the constrictive effect may be mediated through alpha adrenergic receptor sites on the vascular smooth muscle.

9:00 a.m.

3. "Spasm of Cerebral Arteries."
Nicholas T. Zervas, Akio Kuwayama, and Roger Belson
(By invitation)

Intra-luminal modification of cerebral arterial spasm was studied in experimental animals. A reproducible technique for inducing constriction of the basilar artery of the dog was developed using subarachnoid injection of blood into the prepontine cistern. Spasm was assessed by direct micro-cine-photography and angiography. A fine catheter was introduced into the cerebral circulation by means of self-propelling techniques. Vessel diameter was then measured following infusion of a variety of drugs including priscoline, serotin, reserpine or papaverine directly at the site of induced spasm. The results of intra-arterial infusion injection will be demonstrated and the implications concerning management of clinical arterial spasm will be discussed.

9:15 a.m.

4. "Vasospasm, Acute Prolonged and Recurrent Due to Blood in the Subarachnoid Space."
Francis A. Echlin

1. Fresh blood in the absence of evident mechanical stimulation or

vessel injury, will, when injected into the subarachnoid space of monkeys (as described) consistently cause marked acute, at times prolonged and almost always recurrent long-lasting vasospasm of those arteries of the circle of Willis and their branches contacted by the blood.

2. Such acute vasospasm is due to vasoconstrictor agents or factors in fresh blood and its prolongation or recurrence to factors in blood or to agents probably slowly released during its subsequent fibrinolysis.

3. Subarachnoid injections of saline or serum similar to that with blood did not produce any vasoconstriction. The former caused diffuse vasodilation of normal intradural arteries and of those acutely or chronically constricted by injections of blood.

4. The role of vessel injury and of vasomotor mechanisms in the etiology of prolonged and possibly propagated vasospasm is still unclear and requires further study.

9:30 a.m.

5. **"Cerebral Ischemia and Reactive Hyperemia: Radioactive Flow Studies In Experimental Animals with Clinical Correlation and Carotid Endarterectomies."**
T. M. Sundt, Jr., A. G. Waltz, and H. J. Svien

Cerebral blood flow studies using a non-diffusable radioactive indicator will be presented on 10 squirrel monkeys in which the middle cerebral artery has been occluded for two hours and then released. The relative values of cerebral blood flow prior to occlusion, during occlusion, and after occlusion will be presented in graph form. Mention will be made of failure of auto-regulation, pressure dependency in areas of ischemia during periods of occlusion, and reactive hyperemia with red venous blood following the period of ischemia in the experimental animals. Some clinical correlation will be offered with our radioactive flow studies in patients undergoing carotid artery endarterectomy. Further correlation in this small experimental group of 10 animals will be made with our larger group of 180 animals in which areas of ischemia have been followed in both chronic and acute animals, and in which areas of edema and infarct have been plotted and studied histologically.

9:45 a.m.

6. **"Some Difficult Examples of a Simple Problem."**
John T. Garner, Edward P. Hoffman, and C. Hunter Shelden

While most reports of carotid cervical surgery represent straight forward statistical accounts with few details of individual variations, our experience has been that these lesions represent a challenging,

varied experience. We are here outlining five interesting patients whose care greatly influenced our present therapeutic outlook as well as presenting a few perplexing moments during their care.

10:00 a.m.

7. "Surgical Experience in Four Vessel Extracranial Atherosclerosis."
R. M. Peardon Donaghy (By invitation)

Six cases of 4 vessel extracranial atherosclerosis in older patients are presented.

In Oct., 1967, a 66-year-old man was referred to the Medical Center Hospital of Vermont having had in the past three weeks four episodes of transient L. hemiplegia, one associated with coma of four hours' duration, the other three lasting over an hour each. He had become so dizzy on looking up or on full head turning that he could not work and preferred to remain in bed most of the time. An aortic arch study revealed a 1 mm. aperture through the R. internal carotid artery, narrowing of the left internal carotid artery with milder disease of the vertebrals. Carotid occlusion could not be tolerated on either side beyond 10 sec. Brain scan and EEG were normal.

A system was devised whereby a coronary perfusion catheter entered the aorta via the R. femoral artery attached by tubing through a coronary perfusion pump and was introduced into R. internal carotid artery with 50 sec. occlusion. An endarterectomy was then performed and flow re-instituted before the upper catheter was removed. He made an uneventful recovery and returned to his wood-working shop.

A similar but slightly less severe case in a female was then done, in a similar manner with a similar result. The third case, that of a 61-year-old farmer with severe 4 vessel disease ended in fatality when air entered the system because the inlet catheter could not be introduced into the aorta and was left in the femoral artery. Since then two cases have been done successfully and in two cases the procedure could not be done because of severe femoral atherosclerosis and in these cases a local by-pass with simple syringe pump was successfully used. The technique will be described. The complication will be discussed and the measures now employed to avoid it.

10:15 a.m.

8. "Radiological Findings In Cerebral Arteriovenous Malformations."
Jaime Dorfsman and Enrique Eng (Mexico)

The radiological findings in 20 cases of arteriovenous malformations seen at the Neurosurgical and Neurological Unit of The General Hospital

of Mexico (S.S.A.) are discussed.

It is concluded that when this type of lesion is suspected clinically, the indication of an immediate cerebral angiogram (preferably pan-angiography) is fundamental for the correct approach to the treatment, either medical or surgical, and even for prognosis of these lesions. A brief reference is made to the results obtained in the 20 cases seen over ten years.

10:30 a.m.

Coffee Break

10:45 a.m.

9. "Bifrontal Craniotomy For Anterior Communicating Aneurysms—Important Technical Details."
J. Lawrence Pool

Nearly 300 bifrontal flaps have been turned at the Neurological Institute of New York in the past 5 years for aneurysms and other lesions without complications, despite the deliberate opening of the frontal sinuses to obtain a low exposure. Technical details stressed are the following: use of only 4 burr openings; sealing the frontal sinuses promptly with a flap of galea sutured to the dura; avoidance of extensive dural exposure; opening dura anteriorly only; protecting superior longitudinal sinus from crumpling by placing cottonoid over it; resecting just the top of each frontal pole if necessary; reducing brain volume by hypertonic solutions but not by hyperventilation; avoiding interruption of frontal lobe draining veins; gentle steady retraction; dropping the head back after opening dura and re-elevating it for closure; administering Rheomacrodex and Decadron after treating the aneurysm; avoiding clipping or ligation of any part of either anterior cerebral artery; tenting the dura to the center of the bone flap; use of a Hemovac suction extra-dural drain. The effectiveness of muslin wrapping alone for treating an aneurysm or for stopping a leaking cerebral artery is also described and illustrated. (six-minute color 16 mm. movie can be shown if time permits).

11:00 a.m.

10. "The Injection Of Intracranial Aneurysms With A Tissue Adhesive: A Preliminary Report."
Paul H. Zanetti and Anthony F. Susen

Previous work in our laboratory indicated that the direct injection of surgically constructed aneurysms in dogs with the tissue adhesive isobutyl-2-cyanoacrylate, caused immediate and permanent aneurysm

occlusion with minimal tissue reaction. This is a preliminary report of our early experience using the tissue adhesive in human aneurysms. The technique, difficulties, and results will be discussed.

11:15 a.m.

11. "Arteriovenous Malformation of the Central Nervous System."
Jesus Lopez Lira (Mexico)

A general survey of the problem of the Arteriovenous Malformation of the Central Nervous System is made, delineating the most rational plan for its management. Emphasis is made on angiographic studies as the most important and specific means for diagnosis and providing idea of operability and surgical approach. The complete surgical removal of A. V. malformations of the nervous system (when it is possible) is the treatment of choice.

Another form of treatment has not proved its value with a mortality of 24% and disability of 40% against 10.7% mortality and 15% total disability in patients with surgical removal.

11:30 a.m.

12. "Freezing Arteriovenous Anomalies In Brain."
H.A.D. Walder (The Netherlands) (By invitation)

In an attempt to discover the influence of low temperatures on brain tissues and vessels, we did some experimental work in cats and dogs. We did freeze the cervical vessels of cats and dogs to examine what was the risk of touching vessels with a probe during a stereotactic operation. As a result of these experiments we find that the direct influence on vessels is a stripping of the endothelium and consequently a proliferation, especially of the intima. In none of our cases did we see bleeding of the vessels during or after the freezing period of 5 minutes with a temperature between -80° C. and -110° C. Secondly we made the vessels pathological by injecting the vascular wall with nitrogen mustard and also by mechanical trauma. When freezing these pathological vessels we did not see any bleeding during the freezing or several months afterward. The result was also a proliferation of the vascular wall, especially the intima, and also a thrombosation in about 50%. On the basis of these results we did some clinical work on 9 patients with arteriovenous anomalies. We performed the operation by trepanation and exploring the anomalies with freezing under arteriography. The last one has to be done by stereotactic method. In all these cases, we did not see any problem during the operation or afterwards and the recovery of the patients was very smooth. The results were rather encouraging although not in all cases has the arteriovenous anomalies disappeared, but in all those cases there was a very clear influence to be seen.

11:45 a.m.

13. "Cerebral Angiomas: The Sequelae of Surgical Treatment."
Charles G. Drake, A. Loren Amacher, and John M. Allcock

Between January 1, 1952 and December 31, 1969, 66 patients with arteriovenous malformation of the brain were admitted to the Neurosurgical Service of Victoria Hospital, London, Canada. Forty-six were treated surgically; 5 required second operations. The operative mortality was 2%.

Indications for operation were:

1. Initial or repeated bleeding.....87%
   a) intracerebral clot 65%
   b) subarachnoid haemorrhage 22%
2. Intracerebral "steal" 6.5%
3. Epilepsy 6.5%

Postoperative angiography was done in 27 cases and in 9 the investigation was repeated later. These studies have shown that lesions incompletely removed may enlarge and bleed again. Clipping of major feeders has been ineffective in the prevention of future catastrophic haemorrhage. Resection of an angioma stealing blood from nearby eloquent brain may cure the symptoms.

12:00 Noon

14. "Electrothrombosis Of Carotid Cavernous Fistula."
Yoshio Hosobuchi and Charles B. Wilson

The currently accepted definitive operation for carotid cavernous fistula is intracranial ligation of the internal carotid artery beneath the Circle of Willis, and followed by intracranial embolization and cervical ligation of this vessel. Although results from this procedure are satisfactory in many patients, there are patients with malignant fistulae who cannot tolerate ligation of the internal carotid artery, and patients with fistulae fed by both the carotid artery and the contralateral meningohypophiseal trunk. In his recent book, Hamby pointed out that the ideal treatment of the carotid cavernous fistula is direct closure of the fistula. Such a procedure within the cavernous sinus is not routinely feasible, although, as Parkinson has shown, it is possible when required. The current report concerns three patients in whom we directly closed carotid cavernous fistula by direct electrothrombosis. Through a subtemporal approach, a Cooper needle and wire were introduced 1) to the posterior triangle without opening the sinus and 2) through the spheno-parietal sinus to the anterior segment of the cavernous sinus. The further technique and the results will be discussed.

12:30 p.m.

Lunch

CHAIRMAN: Dr. Eldon L. Foltz

2:00 p.m.

15. "A Plastic Disposable Filter To Prevent Brain Damage In Cardopulmonary Bypass and Pulmonary Insufficiency After Massive Transfusion."
Russel H. Patterson, Jr., J. Twichell, R. Brennan, and J. Kessler (By invitation)

Recent studies suggest that of the more than 25,000 patients undergoing open-heart surgery annually in the United States about 40 percent sustain objective damage to the central nervous system. The etiology of the brain injury has been a matter of conjecture, but we suspect that microemboli are responsible since studies with a sonar particle counter devised in this laboratory have revealed that bubble oxygenators generated them in large numbers. In order to confirm the toxicity of the microemboli, cerebral metabolism was studied in animals submitted to cardiopulmonary bypass. Cerebral blood flow and the cerebral metabolic rates for glucose and oxygen were remarkably depressed in a control group but were well preserved in those animals in which the blood was passed through a filter of stainless steel mesh with 25 micron pores. Recently a disposable, autoclavable filter of plastic has been constructed which offers the same protection to the brain of patients undergoing heart surgery. It may also be used to prevent pulmonary insufficiency in battle casualties treated by massive transfusion, a disorder which has been shown to be due to microemboli that form in stored blood.

2:15 p.m.

16. "Management of Combat Wounds of the Dural Venous Sinuses."
MAJ. John P. Kapp, MC and LTC. Isaac Gielchinsky, MC (By invitation)

Wounds of the dural venous sinuses have presented a formidable problem to the neurosurgeon in a combat zone, mainly because of the problems of operative blood loss and cerebral edema secondary to venous obstruction when a critical sinus is occluded. We have considered the dural sinuses as endothelialized vascular structures, and have tried an approach consistent with the techniques of modern vascular surgery in the management of these lesions. Because the sinuses are strangulated in most locations, and difficult to compress or mobilize, methods of obtaining proximal and distal control of hemorrhage have been devised

using balloon catheters rather than occluding clamps. An internal shunt has been devised utilizing this principle, which permits immediate restoration of flow through the injured segment of the sinus, and at the same time provides for a dry operative field during reconstruction of the sinus. Anatomical reconstruction of injured sinuses has been performed, utilizing autogenous vein grafts where extensive destruction of the initima or sinus walls prevented endothelial approximation by primary suture. Ligation of the sinus was performed in lesions of the anterior portion of the sagittal sinus and in cases where extensive injury to tributary veins reduced blood flow through the sinus to the point where it appeared that reconstruction would not be successful. Seventeen patients have been treated thus far using these techniques. Excluding two cases with preoperative evidence of brain-stem injury, the overall mortality has been 7 percent. The overall postoperative patency rates, as proven by postoperative angiography, were eighty percent for vein grafts and eighty percent for primary suture repairs. Blood loss during surgery has been markedly reduced, and the problem of intraoperative cerebral edema secondary to venous obstruction has been eliminated.

2:30 p.m.

17. "Hemodynamic Responses to Acute Quadriplegia With and Without Chest Trauma"

Glenn A. Meyer, Irwin R. Berman, Donald B. Doty, Roger V. Moseley, and Victor S. Gutierrez (By invitation)

This report describes altered autonomic activity as manifested by hemodynamic and blood volume studies in 9 acutely quadriplegic patients. Acute spinal cord interruption at or about T6 causes marked sympathetic hypotonia resulting from both interruption of descending tracts and "spinal shock". Recovery of autonomic neural function is much more rapid than recovery of somatic neural function. Some vasoconstrictor tone returns within hours after wounding. Typically, the acute quadriplegic had bradycardia, arterial hypotension, increased venous capacitance, low total peripheral resistance, and normal or high cardiac output. Pulmonary edema suddenly developed in 4 of 9 quadriplegics, largely caused by over-replacement of intravascular volume. In these 4 patients there was a significantly higher heart rate, hematocrit, total blood volume, and plasma volume. Hourly urine volumes, central venous pressure monitoring, and blood volume studies together with an awareness of the potential hazard of overinfusion are the keys to avoiding pulmonary edema. Early recognition and vigorous therapy of this complication will result in decreased mortality of acute quadriplegic patients.

2:45 p.m.

18. "Occult Congenital Anomalies In Spinal Cord-Injured Patients."
Robert W. Porter

In a series of 75 consecutive autopsies of patients with traumatic paraplegia, eight instances of unsuspected myelodysplasia and three cases of vascular malformation were encountered. All patients were adult mates who had served in the Armed Forces and had no history of pre-existing neurologic abnormality. In all but one case the degree of trauma was thought to be sufficient to account for the spinal cord deficit. In seven of the cases the congenital abnormalities found were at or contiguous with the site of trauma. In the other four, the abnormalities were remote but the extent of the damage at the site of trauma was so extensive that an evaluation of pre-existing disorder was not possible. In a control series of 46 autopsies of non-traumatic cases no congenital abnormalities were noted.

3:00 p.m.

19. "Cervical Disc Herniation and Myelopathy."
Michael C. Shende and Herbert Lourie

Six cases of non-traumatic central cervical soft disc herniation causing severe myelopathy are reviewed. The unusual motor and sensory disturbances are discussed. The unreliability of plain roentgenogram and possible pitfalls of myelographic diagnosis are stressed. Five of the six patients had discectomy and fusion through the anterior approach with dramatically good results. The operative findings and merits of this procedure are discussed.

3:15 p.m.

20. ACADEMY AWARD — 1st Honorable Mention
"Differential Blockade of Dorsal Root and Fibers by Various Chloride Solutions."
J. Stovall King.
University of California Medical Center, San Francisco

3:45 p.m.

21. "Conray Myelography — Report of Forty Cases."
Jose H. Mateos (Mexico)

The classic myelographic study as introduced by Sicard and Forestier in 1922 depended upon the introduction in the subarachnoid

space of a contrast medium (iodine) dissolved in oil. This method has been used in many countries with minimal complications. Campbell in 1963 reviewed the results of the use of a water-soluble contrast medium —Conray—in 80 patients. In this paper, we present our experience in the use of this method in 40 patients. There have been no serious complications except in one patient that had some neuritic pains before the myelogram and increase in symptomatology. We believe that Conray myelography is a safe and useful method but should be limited to cases of lumbar discs.

4:00 p.m.

22. "Positive Contrast Ventriculography Using Water-Soluble Media (Conray)."

Salvador Gonzalez Cornejo (Guadalajara, Mexico)

Adequate demonstration of the structures in the posterior fossa is one of the most difficult problems in neuroradiology. It is even more difficult and more critical in the presence of intracranial hypertension. With the use of air ventriculography, occasionally problems arise in the differentiation of obstructive and communicating hydrocephalus and in the diagnosis of posterior fossa lesions. Positive contrast ventriculography has been used as an adjunctive procedure after air ventriculography or as the primary study of choice.

This technique was first reported by Balado in 1928 using Lipiodol. Pantopaque was introduced in 1943 and Bull in 1950 reported its use in ventriculography. In 1966, Heimburger et al, reported the use of a water soluble media (CONRAY) in positive contrast cerebral-ventriculography, with satisfactory results.

Since 1966 we have performed CONRAY ventriculography in over 50 patients with clinical evidence of intracranial hypertension in whom no hemispheric supratentorial lesion was demonstrated with carotid angiography or if present, was not well localized by angiographic studies.

The procedure was performed under local anesthesia, first a right frontal burr hole was performed, placing a Fischer ventricular cannula in the right lateral ventricle. In a second stage with the patient in the X-Ray Room, the ventriculographic procedure was performed using small amounts of 50% dilution of ventricular fluid and CONRAY. In the presence of markedly dilated ventricular system, it was necessary to use larger amounts of contrast media to obtain adequate visualization. After the contrast media was injected, lateral and axial films were obtained, which were sufficient to give enough information as to the location of the lesion.

The procedure was tolerated very well in all cases. Serial examination of the ventricular fluid, intraventricular pressure and electroencephalographic studies were carried out on a group of patients. No changes

in the ventricular ependyma were observed histologically after the injection of CONRAY in the human or in the laboratory animals.

4:15 p.m.

23. "Isotope Cisternography In The Diagnosis Of Occult Communicating Hydrocephalus."
Francisco Gomez Mendez and Manuel Nava (San Luis Potosi, Mex.)

Evaluation of cerebrospinal fluid dynamics with the use of intrathecal human serum albumin tagged I131 has been used at the University Hospital in San Luis Potosi, Mexico, for the diagnosis of occult communicating hydrocephalus.

The present report shows our experience with 22 cases of cisternography. Hydrocephalus was demonstrated in 12 and the cause of the subarachnoid block was due to tuberculous meningitis, cysticercosis or trauma. Radio-iodinated human serum albumin labeled with I131 at a dose of 75 to 150 microcuries of high specific activity was used and scans were taken at 4, 24 and 48 hours after injection. The best results were obtained in the patients that had a complete block. Cisternography is a safe and valuable diagnostic study for the diagnosis of communicating hydrocephalus.

4:30 p.m.

24. "Pontine Gliomas In Children."
E. Bruce Hendrick

The glioma of the brain stem or the pons in childhood carries an extremely gloomy prognosis. Average survival times rarely exceed 8 months. Radiotherapy and chemotherapy in these cases are of no avail. The author has had personal experience with 80 verified pontine gliomas on the Neurosurgical Service at the Hospital for Sick Children. Two of these patients, however, had cystic tumors in the upper medulla and lower pons and with surgical treatment and radiation, have survival times from 8 to 10 years.

It is the purpose of this paper to discuss the diagnosis of the cystic tumor of the pons and outline a course of management which will enable the surgeon to distinguish between these cases and the solid tumors. While it is a small group in a rather large series, the prognosis is so gloomy on one hand, and the results of treatment of these cystic tumors so gratifying on the other, it is felt that it is important to make these points of clinical and surgical distinction.

5:00 p.m.

EXECUTIVE MEETING (Members Only)

FRIDAY, NOVEMBER 20, 1970

NEUROPHYSIOLOGY SEMINAR
CHAIRMAN: Dr. William Feindel

8:30 a.m.

25. "Positive Dorsal Root Potential and Primary Afferent Hyperpolarization As Part Of A Spinal Cord Gating Mechanism."
Charles Hodge and Robert B. King

Mendell and Wall have described the existence of a positive dorsal root potential (DRP) and have attempted to show that is a response to impulses in small afferent fibers. They feel the positive DRP, in contrast to the more prominent negative DRP elicited by large afferent fiber stimulation, is part of a gating mechanism involved in processing of moxious stimuli by the spinal cord. There have been a number of recent reports which have contradicted the experimental basis upon which part of the gating theory is based.

In this study, performed on unanesthetized, decerebrate, spinal cats, predominantly negative DRP's have been elicited from the lumbar cord dorsal roots by lower extremity non-noxious cutaneous stimuli or electrical stimulation of low threshold cutaneous and muscle afferents. In contrast, noxious cutaneous stimuli or stimulation of high threshold small cutaneous or muscle afferents produced a late, long-lasting positive DRP following the negative DRP.

Intracellular recordings from large cutaneous and muscle afferents in the dorsal root entry zone confirm the existence in response to small myelinated and C fiber input, of hyperpolarization of the same fibers which undergo depolarization (PAH) presumably causes presynaptic facilitation by the same mechanism responsible for post-tetanic potentiation and is in direct contrast to the presynaptic inhibition that is associated with primary afferent depolarization elicited by non-noxious stimuli. The hyperpolarization and presumed concomitant facilitation will be discussed in terms of the differential processing by the CNS, at the initial input level, of noxious and non-noxious stimuli.

8:40 a.m.

26. "Physiologic Mechanism Underlying the Distinction Between Painful and Non-Painful Facial Stimuli — An Expermental Study."
Ronald F. Young and Robert B. King

The physiologic mechanism underlying the distinction between

painful and non-painful facial stimuli was studied in anesthetized cats. In addition, the basis for the clinical observation of differential relief of facial pain by trigeminal tractotomy, leaving some non-painful sensation remaining, was also investigated. The electrical excitability of primary afferent preterminals in the trigeminal brain stem nuclei was studied before and after conditioning with vibratory or painful stimuli to the face. Prior to tractotomy both vibratory and painful conditioning stimuli resulted in increased excitability in both nucleus oralis and nucleus caudalis.

After tractotomy, there was an increase in the control level of excitability of preterminals in nucleus oralis. This was interpreted as reflecting the removal of a hyperpolarizing influence with its origin in nucleus caudalis. There was little difference in excitability changes incident to vibratory conditioning after tractotomy. There was, however, a definite increase in the magnitude and time course of depolarization incident to painful conditioning stimuli. No units responding exclusively to noxious stimuli have been identified in the spinal trigeminal nucleus. The possibility will be discussed that the hyperpolarizing effect of nucleus caudalis on nucleus oralis is the one essential factor in facial pain perception and that the differential relief of facial pain by trigeminal tractotomy may be related in part to the elimination of this hyperpolarizing effect.

8:50 a.m.

27. "Clinical Monopolar Stimulator Implant On Gasserian Ganglion For Anesthesia Dolorosa."
James R. Atkinson (By invitation)

9:00 a.m.
Discussion:
Dr. Feindel

9:15 a.m.

28. "Traumatic Cerebral Edema: An Experimental Model With Evaluation Of Dexamethasone And Furosemide."
Robert L. McLaurin

Intracranial damage, grossly and microscopically similar to that in human head injury, has been produced in the rat by pulsed laser energy. The extent of damage is controllable and reproducible within acceptable limits. Resulting cerebral edema has been measured by the sodium space in the brain, and by wet-dry weights. The method has provided a means of evaluating various drugs for their effectiveness in preventing traumatic cerebral edema. Dexamethasone has been found by this method to have no statistically significant effect on cerebral edema. Furosemide (Lasix) on the contrary, has been found to have a distinct preventive effect on cerebral edema as measured by the above parameters. Data leading to these conclusions will be presented.

9:30 a.m.

29. "The Distribution Of Several Materials In The Sciatic Nerve Of The Rabbit."
Keasley Welch and Hugh Davson

After infusion into the blood stream on a schedule designed to yield reasonably constant activity in plasma, the uptake into sciatic nerve was followed for periods up to 5 hours. For Na24 and Cl36, the permeability of the blood-nerve barrier was found to be some ten times that of the blood-brain barrier and several orders of magnitude less than muscle. The selectivity between Na24 and K42, which is very pronounced for the blood-brain barrier, is very much less so for peripheral nerve.

9:45 a.m.

30. "Neurophysiological Implications Of Deficits Produced By Focal Cortical Excisions Of The Human Sensory And Motor Cortex."
Theodore Rasmussen

Mapping of the sensory and motor cortex by electrical stimulations, during craniotomies carried out under local anaesthesia, provides important guidance to the neurosurgeon is carrying out cortical excisions for intractable focal epilepsy. This stimulation procedure has been carried out in greater or lesser detail, as required by the patient's individual therapeutic problem, in over 1,800 operations in approximately 1,500 patients operated upon at the Montreal Neurological Institute over the past 40 years. In about 10% of these patients, it has been necessary to excise portions of the pre- and/or post-central gyrus alone, or along with adjacent cortex of the frontal, parietal or temporal lobes. Many of these patients had a long-standing moderate or severe hemiparesis preoperatively, but approximately half had little or no evidence of hemiparesis prior to operation. In these latter patients, study of motor and sensory functions in the early postoperative period, and analysis of the nature and degree of restitution of function in the following weeks, months and years, in correlation with the precisely determined cortical area excised, provides data of some importance in the analysis of cerebral mechanisms of sensory and motor function.

10:00 a.m.

31. "Cingulotomy For Psychiatric Illness: Successes And Failures In Sixty-Six Cases."
H. T. Ballantine, Jr., T. V. N. Ballantine, and I. Giriunas

In the past eight years, 160 patients have undergone "cingulotomies" for psychiatric illness or intractable pain. There have been no psy-

chiatric or surgical complications, but re-operation has been necessary in many instances. Sixty-six patients suffering from a variety of disorders of affect (or "mood disturbance") have been followed for a year or more from the date of their last operation. The overall rate of useful post-operative improvement was about 80%, but 42 of the 66 patients required more than one operation.

The need for further surgery was apparently related to failure to place lesions of sufficient size in the cingulate bundles bilaterally at the first operation and this in turn was in most instances a function of x-ray misinterpretation, although lesion dosage parameters played an occasional role. An explanation for final failure seemed to be due primarily to a lack of proper postoperative psychiatric follow-up.

10:15 a.m.

32. The Effect Of Surgical Lesions Of The Brain On Psyche And Behavior In Man."

William Beecher Scoville

1. Different types of mental disease do not require different areas of ablation or tract interruption. There appears to be no need to vary the location of operation in neuroses, cyclical depressions nor schizophrenia.

2. Ablations of inferior portions of the prefontal lobe appear to affect mood, while the superior areas affect higher mental sensitivities and intellectual faculties. Consequently inferior sectioning is preferable.

3. Orbital undercutting offers certain advantages over other inferior quadrant closed operations because of its measured precision under direct vision, permitting precise removal and duplication from case to case.

4. The benefit from cingulectomy operations is probably due to extension of the surgical lesion in the adjacent white matter and not from severance of cingulate connections alone.

5. All prefontal lobe surgery probably benefits by a blunting of function. Therefore it is applicable to those diseases exhibiting exaggerated emotional tension, anxiety, conscience, phobias, or thought distortions, the blunting of which will result in benefit. It is of particular benefit in depression, certain types of pseudo-neurotic schizophrenia, psychoneuroses, drug addiction and psychic, but not organic, pain.

6. It is of no benefit in constitutional psychopathic personalities, criminals, sex perverts and social alcoholics.

7. Lesions in the deeper midline structures may profoundly affect the human psyche and states of consciousness, particularly those lesions of the reticular, limbic, hypothalamic and mamillary areas. Unfortunately lesions in these areas more frequently cause rather than cure schizophrenic-like psychoses.

8. Memory is adversely affected when bilateral lesions are made in the temporal lobe hippocampus. Postoperative seizures do not con-

stitute a social problem and are easily controlled by prophylactic Dilantin.

9. It is believed that ultimate therapy will consist of altering rather than blunting functions of behavior, with therapy directed towards deeper midline structures contained within the limbic, reticular, and hypothalamic systems.

10:30 a.m.
Coffee Break

BRAIN TUMORS

10:45 a.m.

33. "Four Cases In One Family Of Tumors Of The Central Nervous System."

Juan Cardenas y Cardenas (Mexico)

The author presents the cases of four members of the same family which developed tumors of the nervous system. The type of growths were of different variety. One, a meningioma of the occipital foramen and three gliomas, (one cerebellar and two cerebral). Another member was afflicted by cysticercosis of the nervous system and another child by myelomeningocele. A review of as much literature as was available in this respect is provided.

11:00 a.m.

34. "Kinetic Study Of Human Malignant Glioma With Tagged Thymidine."

T. Hoshino, C. B. Wilson, and E. B. Boldrey

H3-thymidine and C14-thymidine have been used extensively in cell proliferation kinetic studies because thymidine is taken up by the cell nucleus exclusively at the time of cell replication (DNA synthetic phase). Selected patients with malignant glioma were given H3-thymidine intraveneously at the time of operation. Parts of the excised tumor were fixed for routine histological studies and for radioautography; representative portions of the tumor were minced immediately after excision and incubated at 37° in the presence of C14-thymidine, so that the pieces were double labeled.

Simple radioautography of the specimens showed uneven labeling

of tumor cells, and the labeling index (per cent of H3-thymidine-labeled cells) varied from 0% of necrotic areas to 25% of the most viable parts in the same tumor; the labeling index of most of the viable parts of the tumor was from 5 to 10%. Some specific labeling characteristics were: 1) giant cells as well as multinucleated giant cells were labeled, but in the latter all the nuclei were synchronously labeled; 2) few gemistocytes labeled with H3-thymidine, and their parts of the tumor had a lower labeling index; 3) labeling was also less in the area of pseudopalisading cells even though adjacent tumor cells showed a higher labeling index; 4) the part of the tumor with sinusoidal structures, which is supposed to be one of most viable parts of the tumor, had a low labeling index; 5) the vascular walls in the tumor, which are vigorously proliferating in most glioblastomas, had a fairly high labeling index, often higher than that of the surrounding tumor tissue; and 6) the marginal zone was of particular interest, as the labeled vascular wall preceded tumor-cell invasion into the normal brain.

From the H3- and C14-thymidine labeled specimens, we could calculate the duration of DNA synthesis of glioblastoma, using the following formula:

$$S = \frac{\text{Number of cells labeled by C14-thymidine}}{\text{Number of cells labeled by only H3-thymidine}} \times \text{Time lag between H3-C14-thymidine administration}$$

The duration of DNA synthesis was different in each tumor, ranging from 4 to 13 hours.

These findings reveal the heterogenicity of glioblastoma, as regards both histopathology and proliferating patterns. Assumed "turn-over" time of the tumor and other characteristics of kinetics in the glioblastoma will be discussed.

11:15 a.m.

35. "Results In Chemotherapy Of Brain Tumors."

Charles B. Wilson, Edwin B. Boldrey, Derek Fewer, and Jean Enot

During a period of 20 months, 75 patients have been treated on our chemotherapy service. The majority have received an alkalyting agent, BCNU, and the remainder have been treated on other protocols: intrathecal methotrexate, imidazole carboxamide, and BCNU-vincristine in combination. The majority of tumors have been recurrent malignant gliomas with other tumor types including medulloblastomas, enendymomas, and a variety of metastatic tumors. A review of post-mortem material suggests that some deaths have resulted from massive tumor necrosis associated with steroid-resistant edema. Our method of evaluation and results will be given in detail.

11:30 a.m.

36. "The Second-Month Syndrome In Irradiated Brain Tumors."
Edwin B. Boldrey and Glenn Sheline

This report is to call the attention of neurosurgeons to the appearance of adverse signs and symptoms during the first ten weeks following completion of radiation therapy to intracranial lesions, the therapy being in the general range of 5,000 rad estimated tumor dose. The peak incidence is during the second month — hence the term "second month syndrome". The duration of these symptoms may vary from a few days to as long as six weeks. The degree of adverse response may be minor or may reach the stage where hospitalization for supportive therapy is imperative. Recognition of this possible development is important to avoid usually valueless exploration of the cranial wound. The manifestation is apparently unrelated to the type of origin of ionizing radiation or to the basic neoplastic process as long as brain tissue is implicated in either the process or the surgical therapy thereof. The manifestation is unrelated to the ultimate therapeutic result.

11:45 a.m.

PRESIDENTIAL ADDRESS: "Aztec Medicine."
Robert H. Pudenz

12:30 p.m.

Lunch

SATURDAY, NOVEMBER 21, 1970

CHAIRMAN: Dr. Charles B. Wilson

8:30 a.m.

37. "Brachiation And The Brachial Plexus.
Hannibal Hamlin

Brachiation supplies a theoretical background for the idea that hominid adaptation during the primeval transition to the upright posture and upper limb dominance has left its mark in the skeletal variability and anomalies of the human shoulder girdle. They form the substrate for the several pain and disability syndromes involving its articulation and mechanical relationship with cervico-brachial musculature and the neurovascular structures that cross the thoracic outlet, notably the brachial plexus. The possibilities of bony encroachment—especially by the first rib—on the plexus may be illustrated by a rapid review of 25 specimens selected from a collection of thoraco-cervical abnormalities (Warren Anatomical Museum, Harvard Medical School).

8:45 a.m.

38. Commissurotomy For The Surgical Treatment Of Generalized Epilepsy".
Jose M. Sanchez Cabrera (Mexico)

After some reports related to this method, (Bogen, Vogel, Sperry and Gazzaniga), a small group of patients were selected to be treated this way. All of them suffered generalized, uncontrollable seizures with bilateral and synchronous discharges in the EEG. Previous to the operation, intracarotid tests, pneumoencephalogram and tachistoscopic tests were carried out to be compared with postoperative results. Special interest was placed on brain disconnection syndrome. The paper is illustrated with the results and a brief review of the literature.

9:00 a.m.

39. "Facial Paralysis In The Prehispanic Era".
Samuel Resnikoff (Mexico)

This brief presentation will consist of showing graphic evidence of a few cases of facial paralysis. They all date back to the Prehispanic era and some are quite old indeed. Some cases simulating facial paralysis will also be shown.

9:15 a.m.

40. "Prehispanic Craniectomies In Mexico".
Hernando Guzman West (Mexico)

Therapeutic craniectomies among primitive or ancient cultural groups reached a certain degree of importance among some of them. In ancient Mexico trephination of the skull was no longer practiced at the time of the Spanish conquest. However about 20 trephined skulls have been discovered in several archeological sites. They all belong to periods between 600 B.C. and 1000 A.D. In them, two methods of performing the craniectomies are evident, one of them apparently only practiced in Mexico. Among some of the skulls, it is highly probable that the skull defects were produced in childhood and as part of a ceremonial act. The reasons why skulls with craniectomies are rare in Mexico are discussed.

9:30 a.m.

41. "Linear Craniectomies For The Treatment Of Craniostenosis"
Daniel Gonzalez (Mexico)

Classical technique for operation of craniostenosis (scaphocephaly and oxicephaly), recommends the ear to ear incision to expose the cranial vault. This incision, simple and rapid as it may be, has not been found adequate by many neurosurgeons and a number of modifications have been suggested. Its main inconvenience is the limited exposure provided and the short extension of the linear craniectomies which may permit a satisfactory result so far as brain growth is concerned, but cosmetic results leave much to be desired. A "double Falconer" type of incision has been tried at the Department of Neurosurgery of the Pediatric Hospital of the National Medical Center of Mexico City, and has provided a very adequate exposure of the vault, therefore permitting the performance of long and sufficiently wide opening of the cranial sutures which leads to both physiological and cosmetic success. Twenty cases have been treated in this hospital by this technique. Two cases illustrate the method.

9:45 a.m.

ACADEMY AWARD PRESENTATION FOR 1970

42. "Physical Factors In The Initiation, Growth And Rupture Of Human Intracranial Saccular Aneurysms".
Gary G. Ferguson
University of Western Ontario, London, Ontario, (Canada)

10:30 a.m.

Coffee Break

10:45 a.m.

43. "Surgical Therapy Of Focal Epilepsy Due To Pial Angiomatosis (Sturge-Weber Syndrome)".
Theodore B. Rasmussen and Francis E. LeBlanc

Twenty cases of Sturge-Weber syndrome have been studied and treated in the past 20 years. All cases presented as problems in seizure control. Eleven cases responded to medical treatment and in nine patients cortical resections were performed. The indications for surgical intervention and the results with regard to seizure control and mental improvement are discussed. Emphasis is given to the existence of occult pial angiomatosis as a cause of seizures in patients without facial angiomatosis. Four such cases are included in the review.

11:00 a.m.

44. "Surgical Treatment Of One Case Of Prenatal Unilateral Radial Injury".
Jorge Ochoa Altamirano (Mexico)

We are reporting an interesting and relatively unusual complication of birth. A radial nerve injury secondary to pressure necrosis in the arm which in this case responded very well to exploration with external and internal decompression.

11:10 a.m.

45. "The Use Of Synthetic Adhesive Materials In Neurosurgery".
Gregorio Gonzalez Mariscal and Francisco Escobedo Rios (Mexico)

Since several years ago, synthetic adhesives have been used to coat intracranial aneurysms which could not be ligated or clipped. These materials also have been used to perform anastomosis of peripheral nerves in animals and humans. The results of these technics have been apparently satisfactory as reported in the literature and in our experience.

The surgical treatment of CSF fistulas through the nose or the ear frequently represent a problem because of the inefficiency of the methods used in their treatment, mainly when the origin of the fistula is a fracture in the middle fossa with tear of the dura, adherent to the

floor of the skull where the closure of the dural defect is difficult or impossible.

We have developed a new technic which has been so far satisfactory in the treatment of this condition. It consists of first exposing intracranially, intra or extradurally or both, the bony defect: the next step is to dry the area with an airstream of oxygen or air and then apply the adhesive to fix the muscle over the bone. If the dura can be sutured, we do it in the usual way. We have been using a Japanese-made adhesive, "Biobond", which is a mixture of several compounds. We present our experience with the use of the method.

11:20 a.m.

46. "Nineteen Years Experience In The Treatment Of Pain At The Mexican National Institute Of Cancer".
M. Cristina Garcia Sancho de Penichet (Mexico)

The author reviews the work during 19 years in this Institution for the treatment of cancer. The methods and neurosurgical techniques are shown for facial pain as well as for the treatment of pain produced by neoplasms in the trunk, pelvis, abdomen and thorax. The same methods are described for the treatment of neuralgic conditions in upper and lower extremities. Conclusions and final results are presented.

11:30 a.m.

47. "Practical Points From An Erstwhile Defendant In Two Malpractice Suits".
William H. Sweet

Evidence will be presented in support of these conclusions:

(1) It makes practical sense to defend all legal actions against physicians for professional negligence provided they are ethically defensible, in order to

(a) diminish the frequency of such actions in general, and

(b) increase the likelihood that the specific physician will be able to secure his own insurance coverage at a more reasonable figure.

(2) One should hold a level of insurance coverage large enough to meet an adverse judgment substantially greater than any yet awarded in this country in this type of legal action—$1,000,000 is the suggested figure.

(3) A successful defense may require scores of hundreds of hours by the involved physicians and their colleagues, since they must (a) educate their legal counsellors in the significance of the medical

facts, and (b) be educated by them as to how to present these facts to the jury within the peculiarly rigid constraints and intense exasperations of our court procedures.

11:45 a.m.

48. "Three Unique Cases Of Damage To The Central Nervous System By Blast Injury".
Robert G. Fisher

These 3 cases of damage to the central nervous system are unique and have caused us to examine the mechanisms involved in detail. The fist patient sustained a carotid cavernous fistula due to a .38 caliber bullet entering the face and lodging near the carotid artery. Arteriogram studies disclosed also a traumatic thrombosis of the internal carotid artery leading to the fistula. Ligation of the intracranial portion of the internal carotid artery and external carotid artery in the neck caused remission of the symptoms and signs of the fistula.

The second patient sustained an extradural hemorrhage of the brain due to a .22 blank placed next to the head in a simulated suicide attempt. The hematoma was evacuated, no fracture was seen and the patient was cured.

The third patient sustained a self-inflicted gunshot wound of the chest, the bullet lodging in the paravertebral tissues without traversing the cord. The patient was permanently paraplegic. No abnormality was found in the spinal cord adjacent to the area of injury.

The literature on damage to the nervous system by blast has been reviewed. Observations on these three patients indicate the intolerance of the central nervous system to any major blast force of the brain, its coverings or vessels entering the brain.

12:00 p.m.

EXECUTIVE MEETING (Members Only)

12:30 p.m.

Adjourn

ACADEMY AWARD WINNERS

Paul M. Linn 1955

Hubert L. Rosomoff 1956

Byron C. Pevehouse 1957

Norman Hill 1958

Jack Stern 1959

Robert Ojemann 1960

Lowell E. Ford 1962

Charles H. Tator 1963

Earle E. Crandall 1964

Stephen Mahaley, Jr. 1965

Chun Ching Kao 1966

John P. Kapp 1967

Yoshio Hosobuchi 1968

Gary G. Ferguson 1970

ACADEMY AWARD 1970

Gary G. Ferguson, M.D., Ph.D.

University of Western Ontario, London, Ontario

"Physical Factors in the Initiation, Growth, and Rupture of Human Intracranial Saccular Aneurysms"

HONORABLE MENTION

1st — J. Stovall King, M.D.

University of California Medical Center, San Francisco

"Differential Blockade of Dorsal Root and Fibers by Various Chloride Solutions"

Robert M. Crowell, M.D.

Massachusetts General Hospital, Boston

"Temporal Occlusion of the Middle Cerebral Artery in the Monkey: Clinical and Pathological Observations"

Thomas B. Ducker, M.D.

University of Michigan Medical Center, Ann Arbor and the Walter Reed Army Medical Center, Washington, D.C.

"Acute Spinal Cord Pathology: Experimental Studies in Graded Trauma"

Richard S. Kramer, M.D.

Duke University Medical Center, Durham

"Electrophysiologic Correlates of Cerebral Adenosine Triphosphate (ATP) Depletion Induced by Ischemia: An Examination of the Metabolic Determinants of the 'Irreversible' Phase of Ischemic Brain Injury"

Guests 1970

Guest	Host
James R. Atkinson Phoenix, Arizona	John R. Green
Charles P. Bondurant, Jr. Oklahoma City, Oklahoma	Robert G. Fisher
Charles L. Branch San Antonio, Texas	Byron C. Pevehouse
Pedro C. Caram Houston, Texas	R. C. L. Robertson
Rene Cardona-Campos Birmington, Alabama	James G. Galbraith
Kemp Clark Dallas, Texas	David H. Reynolds
R. M. P. Donaghy Burlington, Vermont	George L. Maltby
Gary G. Ferguson London, Ontario	Academy
John Garner Pasadena, California	Robert H. Pudenz
Gerald N. Gold Albuquerque, New Mexico	Robert G. Ojemann
Charles Hodges Syracuse, New York	Academy
Takao Hoshino San Francisco, California	Edwin B. Boldrey
Yoshio Hosobuchi San Francisco, California	Charles B. Wilson
John Kapp, Maj. MC U.S. Army	Guy L. Odom
Max Karpin Philadelphia, Pennsylvania	Robert H. Pudenz
J. Stovall King San Francisco, California	Academy
Keith H. Langford Melbourne, Australia	Howard A. Brown
Prof. Jean Lepoire Nancy, France	H. Thomas Ballantnie
Horacio Martinez Romero Mexico City	Frank H. Mayfield
Glenn A. Meyer Galveston, Texas	George T. Tindall
Marc A. Morin Los Angeles, California	Theodore Kurze

Russel H. Patterson, Jr. ..... **Joseph Ransohoff**
New York, New York

Phanor L. Perot, Jr. ..... **William H. Feindel**
Charleston, South Carolina

Javier Reyes ..... **Donald F. Dohn**
Cleveland, Ohio

Howard A. Richter ..... **William Sweet**
Boston, Massachusetts

James T. Robertson ..... **John Tytus**
Memphis, Tennessee

Charles Schibetta ..... **Robert B. King**
Santa Cruz, California

Harold Segal ..... **Aidan A. Raney**
Los Angeles, California

Paul C. Sharkey ..... **James Greenwood, Jr.**
Houston, Texas

Michael C. Shende ..... **Academy**
Syracuse, New York

Bennett M. Stein ..... **J. Lawrence Pool**
New York, New York

Jim L. Story ..... **Lyle A. French**
San Antonio, Texas

Thor Sundt ..... **Hendrik J. Svien**
Rochester, Minnesota

Charas Suwanwela ..... **Eben Alexander**
Bangkok, Thailand

Ronald R. Tasker ..... **William N. Lougheed**
Toronto, Ontario

Manuel Velasco Suarez ..... **William B. Scoville**
Tuxtla Gutierrez, Mexico

H. A. D. Walder ..... **George Ehni**
Nijmegen, Netherlands

Philip Weinstein ..... **Barton A. Brown**
San Francisco, California

Peter Westhaysen ..... **Augustus McCravey**
Munster, Indiana

Ronald F. Young ..... **Academy**
Syracuse, New York

Paul H. Zanetti ..... **Anthony F. Susen**
Pittsburgh, Pennsylvania

Nick Zervas ..... **Hanibal Hamlin**
Boston, Massachusetts

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Av. Cuauhtemoc
Mexico, D.F.

Dr. Carlos Campillo Saenz
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Ciudad Universitaria
Mexico, D.F.

Dr. Ignacio Olive
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Calle de Durango 33-120
Mexico, D.F.

Dr. Gustavo Baz
Honorary Member of the American College of Surgeons
20 de Noviembre 82, 205-206
Mexico, D.F.

Dr. Aquilino Villanueva
Honorary Member of the American College of Surgeons
Av. Oaxaca 32-101
Mexico, D.F.

Dr. Manuel Velasco Suarez
Gobernador Electo del Estado de Chiapas
Tuxtla Gutierrez, Chiapas, Mexico

Ambassador of the United States and Mrs. Robert H. McBride

The Minister of the United States and Mrs. Jack Kubisch

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Frank H. Mayfield	1943
A. Earl Walker	1944
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William S. Keith	1947
Howard A. Brown	1948
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Henry G. Schwartz	1952
J. Lawrence Pool	1953
Rupert B. Raney	1954
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Jess D. Herrmann	1958
Edwin B. Boldrey	1959
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C. Hunter Shelden	1961-62
Samuel R. Snodgrass	1963
Theodore B. Rasmussen	1964
Edmund J. Morrissey	1965
George Maltby	1966
Guy L. Odom	1967
James G. Galbraith	1968

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John Raaf	1943
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Arthur R. Elvidge	1946
John Raaf	1947
Arthur R. Elvidge	1948
F. Keith Bradford	1949
David L. Reeves	1950
Henry G. Schwartz	1951
J. Lawrence Pool	1952
Rupert B. Raney	1953
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C. Hunter Shelden	1959
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Wallace B. Hamby	1948-50
Theodore B. Rasmussen	1951-53
Eben Alexander, Jr.	1954-57
Robert L. McLaurin	1958-62
Edwin W. Davis	1963-65
Robert G. Fisher	1966-68

Past Meetings of the Academy

Hotel Netherlands Plaza, Cincinnati, Ohio ..... October 28-29, 1938

Roosevelt Hotel, New Orleans, Louisiana ..... October 27-29, 1939

Tudor Arms Hotel, Cleveland, Ohio ..... October 21-22, 1970

Mark Hopkins Hotel, San Francisco, and
Ambassador Hotel, Los Angeles, California ..... November 11-15, 1970

The Palmer House, Chicago, Illinois ..... October 16-17, 1942

Hart Hotel, Battle Creek, Michigan ..... September 17-18, 1943

Ashford General Hospital,
White Sulphur Springs, West Virginia ..... September 7-9, 1944

The Homestead, Hot Springs, Virginia ..... September 9-11, 1946

Broadmoor Hotel, Colorado Springs, Colorado ..... October 9-11, 1947

Windsor Hotel, Montreal, Canada ..... September 20-28, 1948

Benson Hotel, Portland, Oregon ..... October 25-27, 1949

Mayo Clinic, Rochester, Minnesota ..... September 28-30, 1950

Shamrock Hotel, Houston, Texas ..... October 4-6, 1951

Waldorf-Astoria Hotel, New York City ..... September 29-October 1, 1952

Biltmore Hotel, Santa Barbara, California ..... October 12-14, 1953

Broadmoor Hotel, Colorado Springs, Colorado ..... October 12-14, 1953

The Homestead, Hot Springs, Virginia ..... October 27-29, 1955

Camelback Inn, Phoenix, Arizona ..... November 8-10, 1956

The Cloister, Sea Island, Georgia ..... November 11-13, 1957

The Royal York Hotel, Toronto, Canada ..... November 6-8, 1958

Del Monte Lodge, Pebble Beach, California ..... October 18-21, 1959

Hotel Sheraton Plaza, Boston, Massachusetts ..... October 5-8, 1960

Royal Orleans, New Orleans, Louisiana ..... November 7-10, 1962

El Mirador, Palm Springs, California ..... October 23-26, 1963

The Key Biscayne, Miami, Florida ..... November 11-14, 1964

Terrace Hilton Hotel, Cincinnati, Ohio ..... October 14-16, 1965

Fairmont Hotel & Tower, San Francisco, California .... October 17-19, 1966

The Key Biscayne, Miami, Florida ..... November 8-11, 1967

Broadmoor Hotel, Colorado Springs, Colorado ..... October 6-8, 1968

St. Regis Hotel, New York City ..... September 21, 1969

The American Academy of Neurological Surgery

Founded October 28, 1938

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R. EUSTACE SEMMES 20 S. Dudley Street, Suite 101-B Memphis, Tennessee 38103	1955

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DONALD F. COBURN 6400 Prospect Avenue, Room 204 Kansas City, Missouri 64132	1938
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JOSEPH P. EVANS University of Chicago Clinics 950 E. 59th Street Chicago, Illinois 60637	Founder
WESLEY GUSTAFSON First National Bank Building McAllen, Texas 78501	1942
WALLACE B. HAMBY 3001 N.E. 47th Court Fort Lauderdale, Florida 33308	1941

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HENRY L. HEYL — 1951
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Hanover, New Hampshire 03755

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KRISTIAN KRISTIANSEN 1962
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DR. OLAN R. HYNDMAN Iowa City, Iowa	(Senior) 6-23-66	1942
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