

cardium and so may contribute to the development of left ventricular failure. Beta-adrenergic blocking agents also have halothane-like actions on left ventricular function.

The anesthetic management of patients with congenital heart disease was discussed by Dr. I. A. Sloan (Hospital for Sick Children, Toronto), who advocated that in cardiac failure infants should be digitalized preoperatively but that general anesthesia usually should not be administered. At the most, only nitrous oxide should be given, and then only if arterial  $P_{O_2}$  is satisfactory. Halothane is considered contraindicated. Instead of anesthetizing such patients, Dr. Sloane suggested that they should be paralyzed with either succinylcholine or curare. Epinephrine should be readily available or actually running slowly through a central venous catheter. Calcium chloride should be given when there are signs of circulatory failure. It was emphasized that increased ventilation *per se* does not necessarily increase but may even decrease arterial  $P_{O_2}$  when right-to-left shunts exist. A slower rate of ventilation is more effective for a better distribution of pulmonary ventilation and perfusion. Prevention of metabolic acidosis is best achieved by maintenance of adequate tissue perfusion during and after surgery and anesthesia.

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#### Academy of Anesthesiology

The Academy of Anesthesiology held its 1967 meeting (September 25-28) at Mountain Shadows in Scottsdale, Arizona.

The scientific program of the Academy this year comprised 16 presentations which ranged in subject matter from the purely experimental, through the clinically practical, to the esoteric and philosophical. As at all Academy meetings, informality and discussion were the rule, and some of the most pertinent observations and the most provocative statements were contained in the comments from the audience following the set papers.

One session was devoted to a virtual symposium on pediatric anesthesia and the

problems peculiar to it by five anesthesiologists who are subspecialists in the field of pediatric anesthesia (Dr. Alan W. Conn, Dr. Edward B. Scott, Dr. I. A. Sloan, Dr. Robert M. Smith, and Dr. C. R. Stephen) and a pediatric surgeon (Dr. Daniel T. Cloud).

The phencyclidine derivative, CI-581, has proven extremely useful in infants (as small as four pounds) and children for such procedures as arteriograms, cardiac catheterizations, suture of lacerations, and skin grafts. Two children received multiple administrations for deep X-ray therapy, one daily for 35 days and the other daily for 30 days, without evidence of increased tolerance to the drug and with no impairment of hepatic function, despite the fact that the substance apparently is metabolized by the microsomes of the liver to two non-anesthetic byproducts which are then excreted in the urine. There is a very rapid onset (30-40 seconds) of profound analgesia when the drug is given intravenously (1 mg./pound), and an equally abrupt termination of the analgesic effect (5-8 minutes), although a much longer time is required for complete reorientation of the patient (30-40 minutes). The drug produces little respiratory depression and is actually stimulatory to some cardiovascular parameters, with modest increases in both pulse rate and the blood pressure. The agent does, however, produce profuse salivation, and must be preceded by the administration of an anticholinergic drug. No ill effects were noted during or after its use in some 250 pediatric patients, and it was concluded that it could be very useful in specialized pediatric situations. It was apparent during the discussion, however, that CI-581 is not a panacea, since no analgesia is produced in some children, whereas others sleep an inordinately long time following its use.

The difficulties associated with the administration of anesthesia for the correction of such congenital anomalies as omphalocele, diaphragmatic hernia and tracheoesophageal fistula were reviewed at length. The problem in anesthesia for omphalocele has always been providing sufficient relaxation for closure after the liver, stomach and intestines have been replaced in the abdomen: when an anesthetic technique is employed which maintains spon-

taneous respirations, the operating conditions for the surgeon are apt to be inferior; on the other hand, if muscle relaxant drugs and an apneic technique are used to permit adequate closure, postoperative respiratory restriction is the rule. One solution is the use of a "sterile mesh" closure in several stages over a period of time; anesthesia is then necessary only for the first and last stages, and the anesthesiologist can use whatever technique he desires without fear of compromising either venous return or respirations.

The problems associated with the repair of congenital diaphragmatic hernia appear to be increasing, since during the past decade or so the mortality associated with this operation has been climbing. Surgeons have begun blaming the more recent anesthetic techniques (which of course include endotracheal intubation) as compared with earlier techniques based on open-drop ether. In point of fact, the anesthetic technique *per se* probably has nothing to do with the changing mortality rate but simply reflects the fact that operation is being performed earlier on sicker infants: before 1950 91 per cent of the operations were performed more than 24 hours after birth, whereas since 1951 only 48 per cent of the operations have been undertaken as late as 24 or more hours after birth. In short, the most desperately ill die within the first 24 hours; if they are operated upon during this period (as they now are) the mortality figures will rise.

The discussion of tracheoesophageal fistula produced general agreement that the present salvage rate of 60-70 per cent is close to the optimum since there is a 20-30 per cent mortality due to associated cardiovascular and gastrointestinal anomalies. There were, however, diverse opinions as to pre- and post-operative treatment and the timing of operation. The particular point of disagreement centered around whether gastrostomy was mandatory, and whether oxygen and high humidity alone in the postoperative period were preferable to intubation and frequent suction.

One feature of the meeting was a tour through the Barrow Neurological Institute, part of St. Joseph's Hospital in Phoenix, which

was established in 1962 for the training of scientists, clinicians and nurses in the areas of nervous and mental diseases. The Institute includes six distinct divisions, each with its own chairman and staff, in the fields of neurology, neurological surgery, neuroanesthesiology, neuroradiology, neuropathology (including an electron microscopy laboratory) and neurobiology (which includes neurophysiology, neurochemistry and neurophysiological psychology). It is rapidly attaining a rank comparable to the National Hospital, Queen Square, in London (the first institute to be devoted entirely to nervous and mental diseases) and the Montreal Neurological Institute at McGill, the Illinois Neuropsychiatric Institute at the University of Illinois in Chicago, the National Institute of Neurological Diseases and Blindness at Bethesda, the Psychoneurological Institute (Bechterew Institute) in Leningrad, and the Institut Bunge in Antwerp.

A major research objective at the Barrow Neurological Institute is the nature of the blood-brain barrier. This does not seem related to molecular size, lipoid solubility or the charges on the molecule which passes the barrier, but there is evidence to indicate that some molecules which pass the barrier readily have isomers which either will not pass the barrier or else pass much less readily. Dr. Eduardo Eidelberg and his colleagues have challenged the barrier in the cat with arabinose, an isomer of pentose which was chosen because it is cheap, soluble and avoids the dangers to laboratory personnel associated with the use of radioactive substances. The measured concentration of arabinose in the brain following its administration revealed that the l-isomer was taken up at a consistently higher rate than the d-isomer, and that this was not a purely physical process of simple passive diffusion since there is a considerable temperature dependence. Furthermore, since inhibitors (*i.e.*, ouabain) interfere with the process, the latter depends upon energy consumption and hence represents active transport across the barrier. They have concluded that the l-isomer of arabinose is capable of "locking in" with a carrier molecule to cross the blood-brain barrier, although there is no clue at

present as to the nature of the carrier molecule, and that the process represents active transport. They have postulated that the barrier is at the membrane of astrocyte cells, which contain the enzyme(s) of the carrier mechanism, rather than in the vessel walls as has been suggested in the past.

A beautiful series of transmucardial studies of substances vital to myocardial function (oxygen, carbon dioxide, sodium, phosphate, potassium, calcium, chloride, nonesterified fatty acids, ketones, pyruvate, lactate and inorganic phosphorus) during open-heart surgery were reported by Dr. Emerson Moffitt from the Mayo Clinic. These investigations showed that the myocardium extracted potassium and chloride, but lost sodium and calcium, during the perfusion. The high arterial levels of nonesterified fatty acids and ketones which were found indicated a less-than-perfect tissue perfusion during the time on the pump-oxygenator, but the production of lactate by the heart (in spite of the high concentrations of oxygen supplied to it) may mean that the myocardial cell is unable to utilize oxygen properly under these conditions. The degree of illness or the length of perfusion did not seem to be important considerations in the variables studied.

A new and interesting type of delayed systemic toxic reaction following repeated doses of mepivacaine (Carbocaine) was reported by Dr. Daniel C. Moore of the Virginia Mason Clinic in Seattle. He has observed that on the third or fourth refill dose during epidural block in the pregnant woman, a reaction consisting of agitation, disorientation, excitement and hysteria may occur, and on three occasions this has progressed to convulsions. This is apparently quite different from the usual type of CNS stimulation seen prior to convulsions in toxic reactions to other local anesthetic drugs, and even the physician's approaching the bed may set off the maniacal behavior. In his experience, no such reactions have been encountered when other local anesthetic drugs have been employed for continuous epidural or continuous caudal block during labor, nor when doses of Carbocaine less than 600 mg. have been employed. Blood samples analyzed for analid derivatives by gas chromatography

revealed definite accumulation following the third, fourth and fifth refill doses. It is apparent, therefore, that caution must be exercised in the use of Carbocaine for prolonged, continuous epidural blocks, and that a total dose of 1500 mg.—even spread out over a number of hours—should be avoided.

There was an interesting description of the "Pima Plan," so named because of its origin in Pima County, Arizona, by Dr. Ian M. Cheaser. This plan was organized as a method of screening the merits of malpractice suits by a panel consisting of five physicians representing the county medical society and five attorneys representing the bar association. The plan is credited with greatly reducing the number of such suits which actually come to trial. Some 52 cases have been so screened in a ten-year period, and the courts have not disagreed with the findings of the panel in the three cases which did come to trial. However, in a vigorous rebuttal of the merits of the plan, it was pointed out that there are many facets of the law involved in a malpractice trial which do not necessarily bear upon the merits of the case, and that screening by such a panel may in effect amount to prejudging and cost the physician a decision which might not otherwise derive from an actual jury trial.

The final presentation of the meeting was of singular historical interest. It consisted of video-taped interviews with several Past Presidents of the American Society of Anesthesiologists, produced by Dr. John J. Leahy of Washington, D. C., and introduced by Dr. John W. Pender of the Palo Alto Clinic in California. These interviews captured in full the appearance, voice, mannerisms and personalities of these former presidents and reconstructed, by their answers to the questions put to them by the interviewer, the state of anesthesiology as a specialty and the progress and problems of the A.S.A. at the times of their terms in office.

All of the other fine presentations also merit inclusion in this report, but of course space prohibits abstracting the entirety. The Program Committee of Dr. Carl E. Wasmuth, Dr. Alan W. Conn, and Dr. Robert L. Patterson received deserved credit for a fine meet-

ing; and Dr. Wallace A. Reed, the local host, a vote of thanks for his well-conducted arrangements.

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#### American Society of Clinical Hypnosis

Increasing maturity in the field of hypnosis was evident in the improved scientific quality of the papers presented at the tenth annual meeting of The American Society of Clinical Hypnosis in New York City, October 18-22, 1967. It was attended by more than 650 physicians from all fields of medicine, as well as by dentists and by psychologists.

Dr. Hans Selye pointed out that the most disturbing, as well as the most common, factors setting off the Alarm Reaction and the General-Adaptation-Syndrome are psychological. If one can remove any of the building blocks, be they conditioning factors (e.g., heredity, environment, attitudes) or challengers (e.g., heat, cold, anesthesia, fear, pain), then resulting disease syndromes cannot develop. Dr. Selye likened stress to a force and disease to the result of the application of stress in a specific manner according to the bodily apparatus and its circumstances. Electricity is a force in the same way. The results of the use of electricity vary according to whether the machine plugged in is a lamp, a washing machine, a heater, or a radio. All symptoms are manifestations of the liberation of energy which is used in different ways. Dr. Selye showed data obtained from rats which were conditioned for responses such as thrombotic and hemorrhagic phenomena, necrosis or calcification. The conditioned lesion in each instance was produced at the anoxic site as the result of stress. Blocking one element in the conditioned response could also prevent the disease.

Understanding of hypnosis as a natural, in-born phenomenon was increased by Dr. Esther Bartlett, anesthesiologist, in her definition of it as "control of a control." Hypnosis is the regulation of input for the purpose of controlling output (behavior). In everyday life we accept some of the signals entering on

efferent pathways. We ignore others ("turning a deaf ear") and distort still others in accord with previous experience and understanding—or lack of it. As Dr. Kenneth Bartlett, dentist, phrased it, we have "filters and amplifiers" which modify incoming signals. Although these operate spontaneously they can also be used deliberately. In what he terms "Need Hypnosis" the operator directs interpretation and response to accomplish such phenomena as pain relief and cessation of bleeding, or increase of bleeding to relieve a "dry socket." Trance induction is unnecessary for this. Dr. Kay Thompson, dentist, bore this out in her presentations and demonstrations using suggestion, redirection of attention and various hypnotic techniques to provide relief of pain and of anxiety in her patients.

Another shibboleth concerning hypnosis, besides the idea that trance induction is needed, was attacked by Dr. Herbert Spiegel, psychiatrist. This was the concept of hypnosis as "sleep." He pointed out that we should shift to the idea that hypnosis is an *alerting* process. We should be saying, "Wake up!" "Pay attention!" "Let's see what capabilities you can apply in this situation!" Wrongly following the notion of sleep, we bore ourselves and our patients with long induction procedures, and then complain because it takes too long and give up a good tool. Or we fall into the trap of becoming upset when the patient declares, "But I wasn't asleep!" and reject a perfectly good means of therapy. Or a colleague who misunderstands hypnosis prevents its use, even in the face of well-designed research showing its proved value, on the basis that "For this we need the patient's cooperation. We can't have him asleep!" Dr. Spiegel emphasized that hypnosizability ought to be evaluated routinely, just as we test the patient's other capacities, his Babinski reflex, knee jerks, etc. We then know at once to what extent hypnosis can be used in each patient. Properly done, hypnosis should take no more than ten minutes in a nonthreatening situation. We are incompetent professionally if we do not learn enough about hypnosis to apply it within our own fields or to make referrals just as we do in other situations.