were passively placed in extension, violent involuntary flexion occurred. The bladder and rectum ceased to act. When the patient was brought to the hospital the bladder was greatly distended. The catheter brought away 74 ounces of urine.

Examination.—Nov. 9, 1908, she lay on her side with knees drawn up, unable to move any muscle groups in the lower extremities, except the adductors of the thighs. The legs and feet were entirely paralyzed. Muscular cramps were frequent and severe and awoke her from sleep. Contractions became more severe if the legs were passively extended. The bladder and rectum were functionless. Ankle-jerks and knee-jerks were much increased; ankle clonus sides and reversed plantar reflex were present on both sides. No abdominal reflexes could be elicited. Pain sense was very much obtunded in the feet and legs; less so in the thighs and trunk except on a level with the upper half of the mid-piece of the sternum, where the severest pain had always been. A space an inch wide vertically and about three inches wide horizontally was without pain response, but tactile and temperature impressions were recognized. Analgesia shaded off into hypalgesia. Elsewhere below this point tactile and temperature sense were obtunded to about the same extent as pain sense. The upper limit of the hypalgesia was at a line drawn horizontally through the junction of the first with the second piece of the sternum. There was no zone of hyperesthesia above this line. Arms and armpits, neck and head were normal. There were no cranial nerve symptoms.

Operation.—By Dr. Harvey Mudd, Nov. 30, 1908, 9 a. m. The spines and part of the laminae of the seventh cervical, the first and second dorsal vertebrae, were removed. The dura bulged irregularly at the upper and lower ends of the part exposed, seeming to indicate a constriction between. The dura was a darker white at the bulging points. The dura was slit centrally from below upward. A sharp spurt of clear fluid, which could not be distinguished from the cerebrospinal fluid, occurred. It seemed that the lower end of a sack had been opened, for the upper end ballooned up with cerebrospinal fluid, as it surged upward in response to the cardiac movements. When the dura was grasped by forceps and gently lifted, small bands of tissue were seen stretching between the dura and the pia. Very slight force with a dural probe sufficed to break these up, after which the ballooning process ceased. There was proliferation and engorgement of the vessels of the pia. The dura was stitched. The wound was closed with a small catgut drain. Surgical recovery was prompt and uninterrupted.

Postoperative History.—December 2 there was movement of left ankle, and fairly good excursion. Reaction to pain and tactile impressions in both legs were much improved. The patient could not be thoroughly examined on account of her objection to it.

December 4: There was improved sensation in all forms. The patient moved the left toes, ankles, leg and thigh; she moved the toes of the right foot feebly. The adductors of both thighs moved. There was a sense of desire to urinate.

December 7: There was no increase of motor power but the patient recognized and localized all forms of sensory stimuli in both legs. There was some pain in the area at the sternum, but better pain sense.

December 11: There was gain in power of all muscle groups of the left leg. The patient could raise her heel off the bed when the toes were resting on the bed. There was no movement of the toes of the right foot but good excursion at ankle; the adductors and abductors of the thigh were improved. Pain and tactile sense responses were prompt and accurate over the entire surface of both legs. There was marked desire to pass water an hour before catheter time.

December 18: The patient passed a small quantity of urine voluntarily. The left leg and foot, including the toes, moved freely. The ankle clonus persisted. The patient had some cramping but very much less severe. The right leg was much improved in all movements, including the toes. The abdominal muscles were active.

December 19: The patient voided eight ounces of urine voluntarily and thereafter emptied the bladder successfully and bowel movements became normal.

December 30: The patient moved all muscle groups in both legs. The ankle clonus, on both sides and all deep reflexes were present. The patient kept her legs flexed but could extend them voluntarily.

January 1, 1909: The patient swung the legs out of bed and sat up on the edge of the bed unaided. The right leg was as good as the left in motor power. The ankle clonus and plus knee-jerks persisted. The feet felt "sleepy," but pain, tactile and temperature tests brought prompt and correct responses.

January 14: The patient could support her weight by placing her hand on a chair to steady herself. There was some contracturing at the knees and full extension brought discomfort, but she could extend the legs voluntarily. The "startings" had ceased. Her general health was perfect.

PROBABLE INSOLATION FOLLOWING ABDOMINAL SECTION IN AN INSANE WOMAN

WILLIAM H. DUKEMAN, M.D.

LOS ANGELES, CAL.

Patient.—Woman, aged 50, brunette, of medium height, weight 150 pounds, the mother of one child. This child died at the age of nine and the patient continually mourned its loss.

History.—I was this patient's medical adviser for fifteen years. While she was never very strong, she had fairly good health, until about four years ago, at which time she learned that she had a fibroid tumor of the uterus and was advised to have it removed. She refused operation, and since then had suffered with a variety of obscure symptoms, seemingly neurasthenic in character. She has always lived a sedentary life of luxury at hotels, both at home and abroad. She rode around the country a great deal in a motor car. I first treated her about fifteen years ago for constipation, and at intervals during eleven years I treated her for attacks of suppression of urine and attacks of vertigo. In April, 1898, I removed a benign polyp of the cervix. She first consulted me six years later about having attacks of vertigo, and I sent her to Dr. H. Bert Ellis, who fitted her with lenses for a slight error of refraction and a little astigmatism. The ophthalmoscope revealed normal and healthy fundi. With the glasses the attacks of vertigo were less pronounced, but she stated that when walking outdoors the sidewalk appeared to rise up in front of her. At this time she was under the care of Dr. R. Wernick, who reported no evidence of kidney disease. He called in consultation Dr. Elbert Wing, who thought the case one of either hysteria or neurasthenia. There was then no evidence of gross brain disease.

Present Illness.—On June 15, 1908, about ten days after Dr. Wing saw her, I was called. Her husband stated that she had gone insane, and was destroying all her letters, etc. She had turned all her jewelry over to him, remarking that she would not need it again. I advised that she be put to bed in the care of a trained nurse and closely watched day and night. In the morning the night nurse informed me that the patient had had a restless night and had slept very little. She took nourishment under protest; in fact she protested not by word but by action against everything that she was asked to do. I diagnosed the case as one of melancholia. On the following day I made a thorough examination and found the uterus about four times its normal size with a fibroid projecting from the right side of the fundus. Her husband stated that a Buffalo physician had diagnosed fibroid three years ago and advised its removal, and that Dr. Wernick had recently done the same thing. The growth of the tumor had been slow and had not interfered with menstruation.

Course of the Disease.—The patient slept very little for the first week. After the first week one gram of chloral was given about 8:30 p. m. and in five minutes she would fall into a sound sleep and generally would have a good night, sleeping from six to eight hours. Without the chloral she would not sleep. Only on a few occasions were we obliged to administer bromids to keep her quiet during the day. On one occasion, during her husband's absence, she became unmanageable, both nurses being unable to control her. After this she was very restless and

disturbed for a couple of days. When first taken ill she appeared to be well nourished but was anemic. This condition was caused principally by self-dosing for many months previous. Every night before retiring she would take a strong laxative pill of some sort or other and follow this in the morning with from 4 to 8 grams of Carlsbad salts, insisting that she was bilious.

Blood: Examination of the blood showed, white cells 7,000, red 1,000,000; hemoglobin, 60 per cent. She was given a tonic and hematopoietic, and encouraged to take a good supply of nourishing diet. At the end of two months the blood examination showed, white cells 1,625, red 1,000,000, and hemoglobin, 85 per cent.

Urine: She secreted a normal quantity of urine and frequent examination always showed it normal.

Mental Condition: Her mental condition continued to grow worse; she would not speak to any one, including her husband, and frequently refused to take nourishment.

Treatment.—From the first I advised her removal from the hotel to the country but could not prevail on her husband to do so. I then advised removal of the tumor. Dr. H. G. Brainerd and Dr. M. B. Campbell were called in consultation and concurred in the diagnosis of melancholia. The question foremost was whether the removal of the tumor would have a tendency to aid recovery. Dr. Brainerd argued against operation; Dr. Campbell advised it. The question of operation was then left entirely with her husband, who, about two weeks later, requested that the operation be performed. She was removed to the Pacific Hospital, and apparently did not realize the change of surroundings.

Operation.—She made very little resistance to being prepared for operation. On September 2, at 9 a. m., I performed a total hysterectomy. Pulse was 90, temperature 99 F. One hour before operation a hypodermatic injection consisting of morphin 0.016 gm. and strychnin 0.0016 gm. was given by advice of the anesthetist, Dr. F. D. Bullard. The patient took the anesthetic, ether, very quietly and safely throughout the operation. On opening the abdomen, the uterus and fibroid tumor presented. There was also a large cystic tumor on the left side (the size of a child's head), which proved to be a tubo-ovarian cyst, intraligamentous, covered by intestines and adherent by fibrous cords and bands over its entire surface, requiring many ligatures and much time in enucleating it. On the right side I encountered the same difficulty but the cyst was only about the size of an orange. The left cyst contained 600 c.c. of brown colored fluid and a concretion the size of an English walnut, the right cyst contained 100 c.c. clear fluid. I removed the entire mass without the use of clamps by double ligating the arteries and adhesions and dividing between ligatures thus obviated the bruising of tissue and preventing any loss of blood. The entire operation was done without any mishap except that the walls of the small cyst, which were very friable, were ruptured in extracting it. As it contained a clear fluid no damage was done. The abdominal cavity was washed out with sterile normal saline solution, and about 500 c.c. at 100 F. were gently poured in before sewing up the peritoneum. Time under the anesthetic was 2 hours 15 minutes. The patient showed some signs of exhaustion but stood the operation well and left the table apparently in good condition. Pulse was 110, of good volume and regular. The last half hour of the operation the patient took very little anesthetic. The entire amount of ether consumed was only 600 c.c.

Postoperative History.—The day was one of the hottest of the season. The temperature of the operating room was from 90 to 95 F. As the patient was perspiring freely she was placed in a comfortable bed previously warmed with hot water bottles. The day nurse who had cared for the patient for the past three months was placed in charge. Between 3 and 4 p. m. I was astonished to learn that the hot water bottles had been renewed because the patient had ceased to perspire. On touching the patient I was shocked to find the skin so extremely warm. The nurse had not noticed any change for the worse. The hot water bottles were hastily removed and the temperature taken by rectum. The thermometer registered 108 F.; the pulse was 160, full and strong; respiration was 26 and the skin was dry and hot. In the axilla the temperature was 107.2 F. The

pupils were dilated, the conjunctiva not reacting to touch. An ice cap was immediately placed on the head and the patient was sponged off with alcohol. She was catheterized and 120 c.c. urine drawn. One hour later the temperature was 106.8 in the rectum; respiration was 30, not full; pulse was 140, full and strong; the pupils were dilated. At 7 p. m. temperature was 106, skin moist, pulse 120 and full, regular and strong; respiration was 30; pupils were dilated, conjunctival reflex did not respond to touch. Up to this time the patient had apparently not reacted from the anesthesia. At 10 p. m. temperature was 105, skin dry, pulse 120, full, regular and strong; respiration 35; pupils less dilated, no reflexes. The catheter was again used and 150 c.c. urine drawn. The symptoms gradually improved during the night. At 7 a. m. patient was again catheterized and 180 c.c. urine drawn. She then commenced to show signs of restlessness, moved her arms and legs, and occasionally rolled her head from side to side. The conjunctiva showed return of reflexes; the skin was dry; temperature was 103.4 by rectum; pulse was 120, full, regular and strong; respiration was 36 and shallow. At 10 a. m. the condition was about the same except that the restlessness was increased. At 12:30 p. m. the pulse was 125, irregular but full and strong; temperature was 103; skin was dry; respiration was 40, very shallow and irregular. The patient became less restless, and had involuntary bowel movements.

Termination of Case.—Suddenly there was a change in the patient's appearance, the lips became livid, and the cutaneous circulation sluggish. There were some slight internal convulsive movements of the chest, the eyes oscillated, the pulse became more irregular but remained full almost to the last, when at 1:40 p. m. life became extinct, twenty-seven hours after operation.

I am at a loss how to determine the immediate cause of death. On the death certificate I inscribed as immediate cause of death basilar meningitis. From the symptoms presented I could not lay the cause of death directly to the operation.

The question foremost in my mind, was the prolonged anesthesia in a patient having some brain lesion the cause of a meningitis? Or was this a case of insolation induced by the prolonged use of the hot-water bottles on this fervid day? Also the patient was more or less fatigued from the prolonged operation, and the system was, therefore, less able to resist the excessive heat, due, in the first place, to the high atmospheric temperature of the weather, and, in the second, to aggravation of this by the uncalled-for prolonged use of the applied artificial heat (temperature unknown).

Bonniman¹ says: "By far the greater number of cases of thermic fever that occur yearly in India are in persons who have not been exposed to the sun. . . . Patients in hospitals who have been confined to bed are frequently the subjects of attack."²

A SIMPLE CANULA FOR THE DIRECT TRANSFUSION OF BLOOD

CHARLES A. ELSBERG, M.D.

Adjunct Surgeon, Mt. Sinai Hospital
NEW YORK

In the operation of direct transfusion of blood by the method of Crile, certain difficulties have sometimes been encountered, and efforts have been made by a number of operators to simplify the procedure. Some experience is required before the Crile instrument can be handled with ease; the caliber of the cuffed vessel is decreased by the canula; sometimes there is difficulty in telescoping the artery over the vein. The steps of

1. Edinburgh Med. Jour., Vol. XIV, p. 1029, 1864.

2. I also refer the reader to article on Thermic Fever in Pepper's System of Medicine, 1st edition.