technic, and a rate of flow of metycaine solution of 60 drops per minute with no pinch clamp applied to the tubing, excellent caudal anesthesia was obtained in twenty minutes. My patient made rapid progress and at the end of one hour was fully dilated, the membranes were ruptured and the head was just on the perineum. The patient was smiling, talkative and cooperative. Rather suddenly she appeared to become drowsy, closed her eyes, rolled her head from side to side, gave several gasps and became apneic and rapidly cyanotic. Her teeth were tightly clenched, and it was with considerable difficulty that her jaw was pried open and a mouth gag inserted. Heart sounds were rapid and barely audible. The blood pressure could not be obtained. The needle was immediately withdrawn from its supposed position in the caudal space, but it was noted before doing so that the rate of flow had not accelerated; in fact it was only about 50 drops per minute. One hundred per cent oxygen was given and nikethamide injected intravenously. Artificial respiration was applied. After about three minutes the patient began to breathe and the cyanosis began to clear. The pulse became stronger and slower. The baby was extracted by forceps while resuscitative measures were being applied to the mother and was normal in every respect, crying immediately after delivery. The patient did not regain consciousness to the point at which she was cooperative for half an hour, and when tested at this time she displayed a complete sensory anesthesia extending as high as the lower axillary line. There was complete motor loss of the extremities. From this point on her convalescence was exactly like that of any other patient receiving a spinal anesthetic.

"The total amount of metycaine solution used was 90 cc. over a period of about one and one-half hours. Since the rate of flow was slow throughout this procedure, even though it came from a reservoir bottle at a level of 5 feet above the patient, with unobstructed outflow, the question arises as to whether it is possible for the anesthetic solution to diffuse into the subarachnoid space, even though the needle is properly placed in the caudal canal." 2 references.

J. C. M. C.

NICHOLSON, M. J.: *Regional Anesthesia.* New England J. Med. **229**: 244–250 (Aug. 5) 1943.

"In the current progress of regional anesthesia three new developments are outstanding. They are continuous caudal anesthesia for obstetrics, the subarachnoid injection of ammonium sulfate for the relief of intractable pain and refrigeration anesthesia (crymoanesthesia)."

J. C. M. C.

JAMES, N. R.: *Infiltrator for Regional Analgesia.* Lancet **1**: 738–739 (June 12) 1943.

"Compressed air . . . passes by means of a Schrader connexion into a modified filter . . . which removes any minute particles of dust, etc. The air then passes into an ordinary two-gallon pressure chamber such as that normally used in commercial paint-spraying, and exerts pressure (50 lb. per sq. in. is the usual pressure) on the analgesic solution contained in a stainless steel inset; the solution is forced up a stainless steel pipe into a non-ferrous air-trap which remains shut until the analgesic solution is exhausted; then the trap opens and releases the compressed air—thus definitely preventing any chance that air will be accidentally injected into the patient. The solution, on leaving the trap, passes along the flexible rubber hose to

a pistol grip control adapted from an ordinary BEN blow-gun. The needle is attached to the record mounting but if it is of a type that does not fit firmly under pressure it may be retained by a 'locking-cap.' The soft-metal hub of the Arnold type of stainless-steel needle however fits firmly enough when placed on the record mount by a twisting movement. The record nozzle is protected when not in use by a cylindrical cap, but if the needle is left in position it may be protected by a specially long cylindrical cap. When an aspiration test has to be done—in splanchnic block, for example—a small injector operated by the pressure of the analgesic solution is attached to the pistol grip by means of a wing-nut after the record mount has been removed. The apparatus is sterilised in hospital by tapping any pipe-line in the sterilising room of the operating theatre and blowing steam through the whole circuit from the air-filter to the orifice of the record nozzle. . . . The apparatus has a hinged lifting-bar so that it can be carried by two people easily, or for short distances by one person."

J. C. M. C.

NEUMANN, C.; SELLERS, E. A.; ROVENSTINE, E. A.; COHN, A. E., AND RULE, C.: *Influence of Spinal and Regional Anesthesia upon Vasoconstriction and Vasodilatation of Small Peripheral Blood Vessels.* Proc. Soc. Exper. Biol. & Med. 53: 159–160 (June) 1943.

"In the current studies of the development of shock during surgical procedures, alterations in the rhythmical variations in the caliber of the small peripheral blood vessels of the fingers and toes have been noticed after spinal anesthesia and anesthetization of the stellate ganglion. It is well known that spinal anesthesia may occasion a fall in blood pressure especially in the presence of moderate hemorrhage or trauma. It is also known that peripheral blood vessels dilate when denervated of their sympathetic supply. These two phenomena, fall in pressure and dilatation of the vessels, are related. What is still unknown is how those other small peripheral blood vessels with their sympathetic supply still intact participate in this result. If the blood pressure and the pulse rate were to remain constant, then, on the assumption that the cardiac output also remains constant, it may be assumed that, as one large set of vessels dilates, another contracts. The pneumoplethysmograph of Turner, as modified by Neumann, was used to record the variations in volume of fingers and toes simultaneously. Normally, waves are inscribed representing constantly occurring changes in volume. These include the pulse waves, synchronous with the cardiac beat, and alpha waves which occur 5 to 7 times per minute and vary in size up to 10 times that of the pulse waves. Twelve patients free from hypertension and from peripheral vascular diseases, ranging in age from 24 to 54 years, were studied. . . . Before anesthesia, the needles being in place, the tracings were normal, the pulse waves being 6 to 7 cu. mm. and the alpha waves up to 60 cu. mm. Two minutes afterward, in the case of spinal anesthesia, the pulse waves in the toe became progressively larger (up to 15 cu. mm.) while the alpha became smaller and almost disappeared. Concurrently, in the fingers, the size of the pulse waves progressively decreased to one-half or even one-quarter their former size, while the size of the alpha waves decreased, as in the toes. Similar effects were noticed on injection of one stellate ganglion. . . . There were no marked alterations in blood pressure or pulse rate during the period of spinal or regional anes-