

product is manufactured under the name of 'trilene,' and is coloured blue so as to distinguish it from chloroform. The chemical formula is $\text{CCl}_2 \cdot \text{CHCl}$. Like chloroform it has three chlorine atoms in its molecule, but, unlike that drug, it does not usually cause cardiac effects other than irregularity of the pulse, and even this is of less frequent occurrence than it is with the use of cyclopropane. . . . Owing to its lack of volatility trilene is not satisfactory when used on an open mask. . . . Stages of anaesthesia . . . are similar to those of chloroform. . . . Trilene being a bland and non-pungent vapour is easily inhaled and does not irritate the respiratory tract. . . . Whether or not capillary oozing is increased is a debatable point. . . . Blood-pressure readings during maintenance anaesthesia show little variation from the normal. Adequate muscular relaxation—one of the most inconstant effects of any inhalation anaesthetic—is not uniform with trilene. . . . In contrast to ether and chloroform, trilene has little effect on the blood-sugar or the blood urea. . . . Trilene is definitely non-inflammable and non-explosive." 3 references.

J. C. M. C.

EVANS, F. T.: *The Present Position of Spinal Analgesia*. M. Press 208: 399-403 (Dec. 16) 1942.

"The cause of spinal analgesia has suffered as much from over enthusiasm as from ignorant criticism. . . . The modern technique aims at producing analgesia to the height required with as little disturbance as possible. The aim, too, is to limit the spread of the drug, so that the analgesia shall remain steady at a fixed level for a sufficient length of time. This is attained, primarily, by the use of certain drugs which are definitely either hypo- or hyperbaric to the cerebrospinal fluid. The so-called isobaric solutions are not recommended, for the cerebrospinal fluid varies in sp. gr. from 1004 to

1010. These light and heavy drugs in combination with suitable posture can be made to give adequate safe analgesia at a predetermined level. . . . The best drug for raising the blood pressure in an emergency is phedracine 2 c.c. intravenously. This will raise a blood pressure of 70 mm. to 120 mm. Hg. almost immediately, and the blood pressure will then fall slowly to some 100 mg. Hg. . . . Low spinal analgesia is limited to the blocking of the spinal nerves below S. 1. . . . Medium spinal block is limited in its upward spread to the umbilicus (T. 10). . . . High spinal block is not recommended beyond the nipple line (T. 4). . . .

"Many drugs are in use, stovaine, pantocaine, spinocaine, etc., but personal prejudice gives preference to two: ethocaine and percaine. . . . Low spinal block should always be performed with the patient in the sitting posture, and is best obtained by using a hyperbaric solution. . . . High spinal analgesia with Etherington Wilson technique . . . is a method employing the time and temperature technique. . . . Unilateral analgesia with light percaine . . . method of spinal analgesia is used for operations upon the kidney and is highly satisfactory. . . . The pentothal-spinal-gas oxygen technique . . . is a combination of preliminary pentothal, followed by heavy percaine spinal analgesia with nitrous-oxide and oxygen to keep the patient sleeping. . . . No patient should ever be subjected to an operation under spinal analgesia without adequate and generous premedication. The patient should be so drowsy that he falls asleep during the operation. . . . Site of puncture should never be higher than the second lumbar interspace (i.e., between L2 and L3) for the cord sometimes ends lower than usual, and is liable to damage. The usual site is the third lumbar interspace. 'Dry tap' in the writer's opinion . . . is due to the dura mater not being sufficiently stretched.

. . . The spinal needle eminently suitable is that devised by Howard Jones, which is 9 cm. long and 1.2 mm. in diameter. The important point about it is that the end is a 45 deg. bevel. Spinal needles are made of stainless steel, and also of nickel, the latter type are malleable and do not break but bend very easily. Pannett's needle is also an excellent type, as is also Hasler's needle. This latter really consists of a guiding needle down which travels the spinal puncture needle proper, which is of very fine gauge.

"Sterilization of needles and syringes is best done by boiling in distilled water. . . . Headache is a distressing complication of spinal analgesia, and may be very severe. . . . The way to prevent headache is to raise the foot of the bed on 6 in. blocks, and to prevent the patient from lifting his head from the pillow for twelve hours. After this time the blocks are removed from the bed and some two or three hours later he is allowed a second pillow, and so on. Treatment of headache varies with its severity. . . . Retention of urine sometimes occurs but is usually overcome by an injection of moryl. It is important not to let the bladder be overdistended. Squint due to paralysis of the sixth cranial nerve, with non-contraction of the rectus externus muscle of the eye, is sometimes seen, though is fortunately rare. It clears up slowly. Burns from hot water bottles are to be guarded against. With low spinal analgesia, it must be remembered that there is analgesia of the soles of the feet as well as the perineum." 4 references.

J. C. M. C.

KOSTER, H.: *Concentration of Procaine in the Cerebrospinal Fluid of the Human Being after Subarachnoid Injection: third report.* Arch. Surg. 46: 301-306 (Feb.) 1943.

"Elsewhere my associates and I have reported on the concentration of pro-

caine in the subarachnoid space during spinal anesthesia in patients in the Trendelenburg position. . . . It was then deemed advisable to repeat the experiment with patients in the Fowler position to determine whether the concentration curves would be significantly changed by the change in posture. . . . One hundred and twenty-eight adult patients received an injection of procaine hydrochloride dissolved in 3.5 cc. of cerebrospinal fluid at the interspace between the second and the third lumbar vertebra. The patients were then placed in the Fowler position at angles of 10 degrees. At different intervals after the injection, samples of 1 cc. of cerebrospinal fluid were withdrawn from various patients. From a group of 55 patients samples were withdrawn from the site of injection. From another group of 56 patients, samples were withdrawn three interspaces cephalad. From a third group of 17 patients, samples were withdrawn from the cisterna magna. The concentration of procaine in these samples was determined in most cases in duplicate or triplicate by the micro-method . . . with an error not over 10 per cent. . . .

At the moment of injection the maximum concentration at the site of the injection is that of the injected solution (43 mg. per cubic centimeter). This falls rapidly, so that at the end of ten minutes the level of concentration is in the neighborhood of 2 mg. per cubic centimeter. The level of concentration falls slowly thereafter until the anesthesia wears off. At the moment of injection the level of concentration three interspaces above the site of injection is 0, but it then mounts rapidly in the first five minutes to the level of 4 mg. per cubic centimeter. After reaching a peak it falls rapidly for approximately four or five minutes to the level of 4 mg. per cubic centimeter. After reaching a peak it falls rapidly for approximately four or five